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I. OVERVIEW OF NJIT

A. GENERAL INFORMATION

Since its founding in 1881, NJIT has been transformed from a local technical school to one of America’s top 200 research universities with national rankings and stature. While moving steadily to increasingly higher levels of excellence in educational performance, NJIT has become a research and development hub, participating in entrepreneurial development and building business partnerships through research and development initiatives. NJIT has evolved into an international presence, both in the scope of its educational programs, including on-site and distance learning offerings, attraction of international students to its programs, and through the reach of its educational, scientific and technological influence at international forums and in international research projects.

Historical benchmarks in the evolution of NJIT include:

- 1881 – Founding of the Newark Technical School in response to Newark Board of Trade
- 1930 – Became Newark College of Engineering
- 1946 – Master of Science programs added
- 1952 – First honors courses given
- 1960 – First doctoral degree awarded
- 1974 – New Jersey School of Architecture opened
- 1975 – Name changed to New Jersey Institute of Technology
- 1981 - First major fund raising campaign since 1885, followed by 2 others
- 1982 – College of Science and Liberal Arts opened
- 1988 – School of Management added
- 1994 – Albert Dorman Honors College opened
- 1994 – Statutory recognition of NJIT as a public research university
- 1996 – New Jersey Institute of Technology Act signed by Governor of New Jersey – establishes NJIT as “a body corporate and politic” and exercise of its powers is “deemed to be public and essential government functions necessary for the welfare of the State and the people of New Jersey.”
- 2001 – College of Computing Sciences opened
- 2001 – Campaign for NJIT completed. Target of $120 million exceeding, and total of $180 million raised.
- Physical plant growing at roughly one building per year since 1979

NJIT is a student-centered university. The promotion of student success drives all university activity and planning. Student progress is carefully monitored. University governance bodies and assessment mechanisms proactively seek to elicit student response and opinions regarding university performance, activities, and planning. Student input is applied to all components of university educational improvement, management, and planning.
The NJIT student body continues to increase in size and improve in the level of academic preparation. NJIT enrollment continues to grow, and reached more than 8,800 students in 2001, including 5,698 undergraduate and 3,164 graduate students. Figure 1 shows the growth in enrollments over the past eight years.

Figure 1: Headcount Growth from 1994 to 2001

Increases have occurred for both undergraduate and graduate enrollments, as shown in Figure 2.

Figure 2: Growth in Undergraduate and Graduate Enrollments from 1994 to 2001
The level of preparation of NJIT students has also continued to increase. Figure 3 shows increases in SAT levels from 1994 to 2001.

Figure 3  Mean SAT Combined Scores for Entering Freshmen

As a result of the increased reputation of NJIT, the introduction of new and attractive programs, the increase in the pool of high school graduates, and the growing infusion of non-traditional and life-long learners into the higher education system, the numbers of highly qualified applicants to NJIT continue to increase. Although SAT scores and other student preparation requirements have risen, NJIT has been able to sustain increases in enrollment while improving selectivity in accepting applicants. Figure 4 shows the general improvement in selectivity for the past 5 years. The fall 2001 applicant pool was slightly lower because admission standards had been raised, but the yield of enrolled students on acceptances was higher.

Figure 4: Percent of Freshman Applications Accepted
The number of highly qualified students enrolled in the Albert Dorman Honors College has continued to rise since the inception of the college in 1993; the growth of enrollment is shown in Figure 5.

**Figure 5: Albert Dorman Honors College Enrollment and Percent of Total Enrollment**

![Graph showing enrollment growth from 1995 to 2001.](image)

Although the majority of NJIT students are commuter students, NJIT students are increasingly residential; Figure 6 shows the increase in the proportion of FTFTF students who are residential rather than commuter students.

**Figure 6: Number and Percent of FTFTF Residential Students**

![Graph showing the increase in residential students from 1995 to 2001.](image)

Currently, 33.6% of all full-time, matriculated undergraduates live on campus.
Students are ethnically diverse. Students enrolled in 2001-2002 were 9.3% African American, 19.2% Asian-American, 8.1% Hispanic-American, <1% Native American, and 29.6% white. Eighteen percent are international students, and 15.6% chose not to report ethnicity. NJIT is currently 13th in the nation in graduation of both Black and Hispanic engineers. In 1999, Inroads awarded Dr. Joel Bloom, Vice President for Academic and Student Services and Dean of the Albert Dorman Honor’s College, its annual award for leadership in recruiting and supporting minority students in higher education.

NJIT awards approximately 1,900 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, liberal arts, mathematics and biomedical engineering. The university offers Ph.D. programs in eighteen professional areas, master’s programs in forty-two specialties, and thirty-five baccalaureate degree programs.

Faculty include 418 full-time faculty and instructional staff and approximately 225 part-time and adjunct faculty. Faculty are evaluated on quality of instruction, research and service. Students routinely rank the overall quality of instruction and the quality of the academic program among the most satisfying components of their college experience. NJIT’s reputation for the quality of instruction is one of the chief reasons given by students for applying to NJIT. NJIT is currently ranked 30th in the nation on faculty resources by U.S. News and World Report. Rankings take into account such factors as class size, the proportion of faculty who are full-time, salary levels, and the number of faculty with terminal degrees in their specialties.

In 1983, NJIT embarked on an ambitious plan to become a computing intensive university. Investments in planning, training, and infrastructure over the last eighteen years have placed NJIT in the forefront in the use of libraries, information access, computing, and other technologies as learning resources. NJIT’s president led the state effort to create the NJEDge.Net higher education network. NJEDge.Net is a non-profit corporation of the New Jersey Presidents’ Council that was designed to enhance the missions of instruction, research, and public service of New Jersey’s colleges and universities. The range of capabilities, resources, and services offer economies of scale, provide expanded opportunities for integrating emerging technologies, and promote new forms of inter-institutional collaboration. This private, statewide inter-institutional infrastructure effectively “raises the bar” for high performance data and video capabilities across the state’s three LATA boundaries and extends the reach of higher education to off-campus learners, K-12, corporate, and community constituencies.

NJIT students have available to them all the advantages of a digital library and campus. Continuing and distance learning at NJIT have become core activities. NJIT has been playing a leadership role in this arena since as far back as 1978 with the publication of the seminal book, The Network Nation: Human Communication via Computer, by Starr Roxanne Hiltz and Murray Turoff, now both NJIT College of Computing Sciences Distinguished Professors. In 1984, the results of their scholarship led NJIT to coin and trademark the term, “Virtual Classroom®.” By 1989, NJIT had registered the mark with the U.S. government and had begun to offer the first classes based on this model. Since then, as New Jersey’s technological research university, NJIT has been using multiple modes of technology to offer enrollment both to the on-campus student in need of flexible course scheduling alternatives and to the remote student who, for a variety of reasons, is unable to reach the NJIT campus. Each semester NJIT currently enrolls
approximately 1,600 students, representing 20% of its academic student body, in distance learning courses. Over 4,000 students currently participate annually in distance-based, non-credit professional development training.

NJIT’s evolution to a vital 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 $52 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 sustainable manufacturing systems, infrastructure, information technologies, environmental engineering and science, biotechnology, 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. Figure 7 shows the growth and sources of research expenditures from 1991 to 2000:

![Figure 7: Research Funding Levels and Sources from 1994 to 2000](image)

* funded by multiple sources

NJIT’s operating budget in 2000-2001 totaled $194 million, and total revenues exceeded total expenses by $3.6 million. NJIT completed a fund-raising campaign and exceeded its goal of $120 million by 2001. Figure 8 shows the growth in the endowment fund to its 2001 level.
NJIT has long been an active community partner in the development of Newark’s and New Jersey State’s economy, playing a large role in Newark’s revitalization. NJIT is currently a leader in the development of University Heights Science Park, which is a collaborative venture among Newark’s educational institutions, the city and community of Newark, and private industry. President Fenster has served on numerous city and statewide taskforces and international educational and community service projects. He currently is Vice Chair of University Science Park. NJIT is also a key player in the high technology corridor in New Jersey which constitutes a hub of research and development activity in support of service, manufacture, and distribution of goods and services in New Jersey and from New Jersey to the world.

NJIT’s 48 acre, computing-intensive, residential campus is located in the University Heights section of Newark, less than 10 miles from both 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 Mount Laurel Campus, and at extension sites at colleges and other locations throughout New Jersey and increasingly through a variety of electronically mediated distance learning formats. Courses are also delivered on-site and through distance learning at many other locations and internationally.

The Center (University of Florida) ranked NJIT 101st (adjusted for controls) of 4,700 institutions with higher education offerings in the nation in its 2001 report on The Top American Research Universities, and highest in the nation for positive change in the ranking for federal research funding from 1990 to 1999. 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: 2001 Annual Guide to America’s Best Colleges placed NJIT among the top 200 “Best National Universities” for the fifth straight year. Yahoo! has ranked NJIT among the top 10 “most
wired “ public university campus for four consecutive years. *Careers and Colleges* included NJIT in its list of 15 great schools at great prices.

In benchmarking exercises conducted to compare NJIT with both target and comparable peer institutions, NJIT compares favorably on many measures. For institutions with similar student bodies, similar academic programs, and that are public institutions, NJIT does equally well or better on many measures. Appendix 1 includes benchmark comparisons of NJIT with 13 universities nationally.

**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* with emphasis on applied and multi-disciplinary areas such 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 the state’s largest business incubator system, 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.

A complete undergraduate catalog can be found in Appendix 2, and a graduate catalog can be found in Appendix 3.

B. THE COLLEGES OF THE UNIVERSITY

Newark College of Engineering

In 1885, Newark Technical School (founded in 1881), a tuition-free evening school, opened its doors to its first class. The curriculum and its philosophical underpinnings were expanded in 1919 when state approval was secured to offer college-level courses. The new unit was named Newark College of Technology at Newark Technical School. The curricula included a day program leading to a baccalaureate degree in Chemical, Electrical, or Mechanical Engineering.

In 1920, the name was changed to the College of Engineering of Newark Technical School. Over the next decade, the focus of the institution shifted increasingly to college-level programs and, in 1930, the name was changed to Newark College of Engineering. In 1931, the curriculum was expanded to include a baccalaureate degree in Civil Engineering, and, by 1946, a master’s degree was offered in Chemical, Civil, Electrical and Mechanical Engineering. In the period following World War II, many new programs were added, including a master’s degree in Management Engineering (1950), baccalaureate degrees in Industrial Engineering (1960) and Engineering Science (1968), and the Ph.D. in Chemical Engineering (1960), Electrical Engineering (1960), Mechanical Engineering (1966), and Civil Engineering (1969).

New Jersey School of Architecture

New Jersey’s only state-supported School of Architecture was authorized by the Board of Higher Education in March, 1973. As early as 1958, the New Jersey Society of Architects actively lobbied for the creation of a public College of Architecture in New Jersey. In 1972, the NJSA asked the American Institute of Architects (AIA) to appoint a National Advisory Committee to make recommendations for a public School of Architecture in New Jersey. Subsequently, the National Advisory Committee recommended the establishment of the school in Newark in 1973.

NCE made a formal proposal to the State Board of Higher Education that was approved and the New Jersey School of Architecture (NJSOA) was born. The first class graduated in 1977. Accreditation was granted in 1978. In 1984-85 the New Jersey Board of Higher Education granted NJIT’s School of Architecture the authority to offer the degree Master of Architecture. In the same year the New Jersey Board of Higher Education also approved a Master of Science in Architectural Studies.
After years of incremental facilities improvement, the university committed the necessary funds to house the School of Architecture in new facilities in 1995. Construction on the new building began in 1997 and was completed in 1998.

The Undergraduate Program encompasses an accredited B.Arch degree program and a non-accredited program leading to a B.Sc. in Architecture. The Graduate Program contains both an NAAB accredited professional M.Arch degree and a non-accredited post-professional M.S.Arch, as well as a non-accredited Master in Infrastructure Planning or M.I.P. The Master of Science in Architectural Studies or M.S.Arch. is a graduate program, which is not accredited by the NAAB; it allows for tailor-made advanced studies in areas of specialization such as CAD and building science research. The Ph.D. in Urban Systems is offered jointly by NJIT, Rutgers, and UMDNJ. It is an interdisciplinary and inter-institutional degree with concentrations in urban health, urban environment and urban education. There are four dual degree options for both graduate and undergraduate upper level students.

**College of Science and Liberal Arts**

The College of Science and Liberal Arts was established in 1982 to more fully focus and build upon the comprehensive educational model that had developed at NJIT. CSLA provides students with the skill sets needed for the professional marketplace and broad participation as citizens, including literacy in mathematical, physical and biological sciences, as well as in the traditional liberal arts disciplines.

The College encompasses Aerospace Studies, Biological Sciences (federated with Rutgers), History (federated with Rutgers), Humanities and Social Sciences, Mathematical Sciences, Physics, and the NJIT/Rutgers Theatre Arts Program. CSLA has moved into the forefront of national and international research projects, from solar astronomy to computational and mathematical modeling.

**College of Computing Sciences**

In 2001, the Board of Trustees approved the formation of the College of Computing Sciences, the first college of its kind associated with a research university in the New York Metropolitan area. The College of Computing Sciences (CCS) encompasses the Computer Science Department (CS), Information Systems Department (IS), and the Information Technology Program (BS-IT).

This College was founded to focus on computing, defined as the integration of computer science and other disciplines to address a wide variety of problems and applications. The growth of computer science and information technology, and of student interest in careers in this area, makes it important for NJIT to establish computing as one of its major areas of continued growth in future decades. The College aims to be the leader in New Jersey in computing research and education, and to be among the top programs in the nation. As part of NJIT, a public research university, the mission of CCS reflects that of the university as a whole.

**School of Management**

Since 1992, the School of Management (SOM) of NJIT has offered programs in executive education. SOM is accredited by the Association to Advance Collegiate
Schools of Business (AACSB), the international association for management education and the top national accreditation body for management education. In addition to the B.S. in Management, the School of Management's diverse graduate program offers students the opportunity to specialize in one of several areas, ranging from market and financial management to international business and environmental management. Courses are offered at NJIT's Newark campus, as well as at extension campuses at Drew University in Madison and Ramapo College in Mahwah. The School also offers an extensive evening and weekend schedule.

The School of Management’s goals include graduating students skilled in the management of technology-based organizations in the manufacturing and service sectors, both public and private, with an emphasis on productivity and international competitiveness. Students are exposed to a program of management study which fosters an appreciation of technological literacy and ethical standards which are essential for working in today's global business environment. SOM promotes lifelong learning and to that end conducts educational programs for the management community. The School of Management draws upon NJIT's resources in science and technology to present a focused program emphasizing the application and management of technology to improve decision-making and competitiveness in organizations. The program stresses computing skills, and students are introduced to a wide range of software programs currently used for business applications.

The rapid migration to e-commerce models stemming from the growth of the Internet is a theme that runs through SOM’s undergraduate and graduate curricula. Courses are focused on business process improvement derived from the use of e-commerce tools and technologies. In addition, the curriculum addresses managing fundamental changes in the nature of organizations stemming from the continued adoption of the new technologies that are driving e-commerce.

The School of Management has recently developed the next generation of courses in executive education: The Executive Master of Business Administration (MBA) is in the Management of Technology. This program is designed to prepare up-coming executives for the challenges ahead, while allowing them to continue in their jobs. The program can be taken part-time, and program study has immediate application.

**Albert Dorman Honors College**

Building on an honors program established in 1952, the Albert Dorman Honors College was created in 1993. Its mission is to attract exceedingly able and highly motivated students to NJIT and to match their potential by providing a rich and challenging educational experience and to prepare them for positions of leadership. Entering students are required to have combined SAT scores of 1250, to be in the top fifteen percent of their high school classes, and, once at NJIT, to maintain a GPA of 3.0 during the freshman year and 3.2 thereafter. Enrollment at the Honors College has exceeded the enrollment target of 500 students for fall 2001.

Academic requirements include taking at least eight courses in honors sections of the General University Requirement (GUR) courses in the first two years, taking two honors seminars (in Humanities and Science/Technology/Society) in the final two years, attending the Honors Colloquium series, and taking a senior honors capstone project/research/independent study course.
Over the history of the program, freshmen honors scholars have enrolled in all majors at NJIT: engineering (63%), the sciences (22%), architecture (14%), and management (1%). Many have gone on to leadership positions in industry, and at least 60% of the graduates have gone on to graduate schools and professional programs. The average GPA of graduating honors scholars has been 3.6 throughout the years.

**Distribution of Students and Faculty by School, Fall 2001**

Table 1 summarizes the distribution of full-time and part-time enrollments for graduate and undergraduate students by school for fall 2001.

<table>
<thead>
<tr>
<th>2001</th>
<th>Undergraduate</th>
<th>Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full Time</td>
<td>Part Time</td>
</tr>
<tr>
<td>Newark College of Engineering</td>
<td>1771</td>
<td>609</td>
</tr>
<tr>
<td>College of Computer Sciences</td>
<td>1240</td>
<td>211</td>
</tr>
<tr>
<td>New Jersey School of Architecture</td>
<td>460</td>
<td>44</td>
</tr>
<tr>
<td>School of Management</td>
<td>305</td>
<td>58</td>
</tr>
<tr>
<td>College of Science &amp; Liberal Arts</td>
<td>238</td>
<td>69</td>
</tr>
<tr>
<td>Non Matriculated</td>
<td>109</td>
<td>584</td>
</tr>
<tr>
<td>Albert Dorman Honors College*</td>
<td>500</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>4123</td>
<td>1575</td>
</tr>
</tbody>
</table>

* Non-additive enrollment

Table 2 shows the distribution of full-time faculty in fall 2001.

<table>
<thead>
<tr>
<th></th>
<th>Full Time Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newark College of Engineering</td>
<td>152</td>
</tr>
<tr>
<td>College of Computer Sciences</td>
<td>62</td>
</tr>
<tr>
<td>New Jersey School of Architecture</td>
<td>27</td>
</tr>
<tr>
<td>School of Management</td>
<td>29</td>
</tr>
<tr>
<td>College of Science &amp; Liberal Arts</td>
<td>148</td>
</tr>
<tr>
<td>Total</td>
<td>418</td>
</tr>
</tbody>
</table>
C. ORGANIZATION AND ADMINISTRATION

Student Governance

Student input is vital to the workings of the governance and administration of the university, and student goals, needs, and input serve as foundations for university performance and aspirations. Both formal and informal channels of communication and interaction are used to optimize responsiveness to students, and NJIT continues to explore mechanisms to increase and improve the effectiveness with which the response is made.

Student Senate

The NJIT Student Senate is the governing organization of the undergraduate student body. The main purpose of the Student Senate is to represent undergraduate students by acting as a liaison to the NJIT administration and faculty to address issues concerning academics and student life at NJIT. It is also involved in planning activities for the student university community, including open forums and feedback sessions. The Student Senate oversees all 70+ undergraduate student organizations, including the newspaper, yearbook, radio station, cultural and social organizations, and honor societies, and allocates budget requests from student activity fees to these organizations. These organizations are required to attend a monthly cabinet meeting hosted by the Student Senate to be recognized and receive funding. The Director and Associate Director for Student Activities advise the Student Senate.

Student Senate membership is restricted to undergraduate students. The Executive Board of the Student Senate is comprised of a President, Vice President of Administration, Vice President of Student Affairs, Vice President of Finance, Treasurer, Recording Secretary, and Corresponding Secretary. The Executive Board meets weekly to discuss student concerns and plan the weekly full Senate meetings. It does not have voting power during full Senate meetings except in the case of a tie. In addition, the Executive Board also meets biweekly with the Dean of Students Office to discuss student concerns. By the Student Senate Constitution, the Senate President is required to meet with the President of NJIT at least once each semester.

The remainder of the Student Senate is comprised of one representative for each of the colleges of the university, one representative for each of the academic majors, one commuter and one resident representative, class presidents (freshman, sophomore, junior, senior), and four freshmen representatives. The entire Senate holds open meetings every week. Elections for all but the freshmen positions are held in April (freshmen positions are elected and assumed in September) and positions are also assumed in April. All executive board members and representatives are required to hold office hours in the Student Senate Office located in the Hazell Center. Positions are elected for one year.

The Interfraternity/Sorority Council(IFSC) and Greek Letter Council (GLC)

The IFSC and the GLC are the governing bodies for all recognized Greek organizations at NJIT. They consist of representatives from member chapters, and serve as the central administrations, which govern and adjudicate the activities of these chapters. The IFSC
and GLC also work to promote the highest degree of cooperation between the Greek community and the university.

Currently there are fifteen fraternities and seven sororities at NJIT, representing ten percent of the undergraduate population. Eleven fraternities are members of the National Interfraternity Conference; two are members of the National-Panhellenic Council and two fraternities and sororities are members of the National Latino Greek Council.

While considered social organizations, fraternities and sororities also place great emphasis on scholarship, leadership development, and community service. NJIT’s Greek chapters have contributed thousands of dollars and hours to local and national philanthropies and organizations. Members of the Greek community have been recognized locally and regionally for efforts in community service.

**Graduate Student Association (GSA)**

The objectives of the NJIT Graduate Student Association are to represent and articulate the interests of the graduate students; to promote communication among students, faculty, and the administration; oversee the expenditure of graduate student association fees; and to promote and encourage the professional growth, social and cultural development, and academic excellence of students in the graduate programs of the New Jersey Institute of Technology.

The Executive Board of the GSA is comprised of a President, Vice President, Treasurer, Secretary, and Technology Officer. Each September, the Executive Board reviews the operating budget prepared by the Treasurer and submits a completed copy to the general body for a vote. Once passed, the budget is forwarded to the Student Activities Budget Review Committee for approval. The advisor of the organization is the Dean for Graduate Studies and he is an ex-officio member of the GSA. Each graduate program has one elected Program Representative to the Graduate Student Association. This representative speaks on behalf of students in the program for which they have been elected. There are at least two meeting per month during the academic year.

Membership in the Graduate Student Association is open to any student currently enrolled in graduate programs at New Jersey Institute of Technology and paying the Graduate Student Association fee at New Jersey Institute of Technology. Membership ceases at the date of graduation or termination of affiliation with NJIT.

**Other Mechanisms for Monitoring Student Needs and Opinions**

Student achievement is routinely monitored in reports on retention and graduation, job placement, and in program reviews and outcomes assessment studies. In addition, students evaluate all courses (face-to-face and distance learning) and reports of results are provided to faculty, chairs, deans, the associate vice president for distance education, and the provost for action. A routine program of surveys captures information about enrolling students, student satisfaction, graduating students and alumni. Student focus groups are conducted frequently across the university within colleges, departments, the library, student affairs, and other units within the university in order to acquire student input for educational and management decision-making.
Faculty Governance

The Faculty Council, established in 1965, assures faculty participation in all aspects of university activity, making the voice of the faculty heard on matters of concern to the NJIT community. In order to promote the harmonious, efficient, and educationally effective operation of the university, the Council exercises its responsibility to communicate, initiate, investigate, deliberate, and recommend. In line with written policies and past practice, the council participates in a system of shared governance, assuring that faculty are represented on university committees addressing academic issues, promotion and tenure, and searches for new faculty and academic administrators. The Faculty Handbook, which is the formal document specifying policies and procedures governing academic affairs, is regularly reviewed and revised. On all major change issues of relevance, the Council recommends to the faculty at large, which alone has the authority to speak for the faculty. Each department has one elected member on the Council, which elects its chair and vice-chair annually. The faculty also assess certain academic administrators every three years, as specified in the Faculty Handbook, and this process was most recently completed in April 2000. Results were reported to administration and faculty.

Each department of the university has a department committee on promotion and tenure consisting of the department chairman and all tenured faculty in the rank of professor. Promotion and tenure committees reach concurrence on the hiring of new faculty rank, and advise the department chair on promotions and tenure. The promotion and tenure committees also review performance of faculty. In addition to the departmental promotion and tenure committees, a university committee on promotion receives the recommendations from departmental committees and prepares recommendations with regard to promotion, tenure, and salary adjustments.

Faculty elect members and serve on such committees for departmental chairs. Internal candidates for chair need a two-thirds vote of the department’s faculty. The selection of the chair is then reviewed for review by the President. In addition, faculty are represented on search committees for senior academic administration positions.

Faculty and Staff Representation

The faculty and professional staff are represented by the PSA/AAUP (the Professional Staff Association/ American Association of University Professors) for all labor/management issues. It is the largest union at NJIT representing the interests of NJIT's faculty and professional staff. The PSA existed as an independent labor organization until 1988, when the membership voted to affiliate with the American Association of University Professors, a national organization with extensive experience handling issues specific to higher education.

The primary function of the PSA/AAUP is to negotiate and administer the collective bargaining agreement. Contract administration includes a wide variety of tasks and varies from verifying the administration of contractual salary actions to processing violations of the contract. The Governing Board, elected from the various constituencies of the bargaining unit, acts for the membership, but each contract must be ratified by the majority of all voting members.
In the spring of 2001, a new four-year contract between the PSA/AAUP and administration was successfully negotiated and approved by a nearly unanimous vote of members of the bargaining unit.

**Administrative Structure**

In addition to Saul K. Fenster, who has served as NJIT’s President since 1978, and Provost William Van Buskirk, who also serves as Senior Vice President for Academic Affairs, the senior administration consists of Senior Vice President for Administration and Treasury Henry Mauermeyer, Vice President for Academic and Student Services and Dean of the Albert Dorman Honors College Joel Bloom, Vice President for University Advancement Judith Boyd, General Counsel Robert Avery, and Vice President for Research and Development Donald Sebastian. The Office of Institutional Research and and Planning and the Office of Compliance and Community Relations also report to the President.

NJIT currently consists of six colleges: Newark College of Engineering, New Jersey School of Architecture, College of Science and Liberal Arts, School of Management, Albert Dorman Honors College, and the College of Computing Sciences. Each college is headed by a Dean. There is also a Dean of Graduate Studies. All academic Deans report to the Provost. Major educational structures include the Division of Continuing Professional Education, which houses the distance education and continuing education program. The latter offers onsite as well as online courses and certification programs, and is one of the leading training providers in New Jersey for engineering, architectural, professional, management and technical education training courses. These programs and offices report to the Vice President of Academic and Student Services.

Complete and current organization charts appear in Appendix 4.

**Board of Overseers**

Since 1959, the university’s Foundation has contributed to the institution through the professional expertise of the NJIT Board of Overseers. The Board of Overseers is the fiduciary of the Foundation at NJIT. The President of NJIT is the President of the Board of Overseers. Chartered as the Newark College of Engineering Research Foundation, the Foundation’s stated purpose includes the support and encouragement of research and the establishment of fellowships and lectureships. The mission of the Board of Overseers was later broadened to include fund raising and support of all the academic programs at the university. The Board has also become a valuable resource in advising on research directions as well as on university marketing efforts.

The Board of Overseers is comprised of senior business executives who help bridge the university and the corporate community. It meets four times annually. There are five standing committees (Finance, Fund Raising, Research, Marketing, and Membership). Board members have played an integral part in the success of the capital campaign, *The Campaign for NJIT: Design for the Future*. They have been instrumental in establishing endowments and scholarships, developing contacts with prospective individual and corporate donors, and recruiting nationally and internationally recognized faculty.
Board of Trustees

The NJIT's Board of Trustees is the university's governing board and has a broad range of statutory powers and responsibilities (e.g., fiduciary for the university, institutional policy and planning, investment of institutional funds, legal affairs, etc.). Membership of the Board of Trustees includes the Governor, or the Governor’s designee, and the Mayor of Newark, as ex officio nonvoting members, and up to 15 citizens of the State appointed by the Governor with the advice and consent of the Senate. The Board recommends potential new members to the Governor.

The officers of the Board of Trustees consist of a Chairperson and Vice-Chairperson, elected at the first annual meeting in September. Board officers also include a Secretary and a Treasurer. The President of NJIT is approved and appointed by the Board, and the President of NJIT is the chief executive officer to the Board, and may serve as Secretary or Treasurer, but may not be a member of the Board.

The Board meets about six times a year. There are five standing committees (Finance and Audit, Buildings, and Grounds; Development and Public Affairs; Personnel and Education Affairs; Executive Committee; and Dispute Resolution Committee).

The names of all members of the Board of Overseers and Board of Trustees appear in Appendices 5 and 6.

Committee Structure

The university committee structure includes 29 standing committees that develop information, policy drafts, recommendations, and plans for action on a broad array of institutional issues. Members of the university community from the ranks of students (for selected committees), faculty, staff, and administration are included on all standing committees, providing the opportunity for all members of the NJIT community to communicate and to have influence on the development of policies, practices, and planning initiatives.

Committees Reporting to the President

Affirmative Action/Human Relations Council
Committee on University Awards, Lectures and Commencement
Long Range Planning Committee
Committee on Promotion and Tenure
Committee on Women’s Issues

Committees Reporting to the Provost/Senior Vice President for Academic Affairs

Committee on Academic Affairs
Committee on Academic Standing
Review Committee for Department and Program Assessment
Committee on Sabbaticals
Committee on Patent Policy
Committee on Research
Graduate Council
Committee on Protection of Human Subjects
Committee on Student Appeals
Committee on Student Professional Conduct
Committee on Undergraduate Curriculum Review
Committee on International Relations
Graduate Appeals Committee
Committee on Academic Computing
Excellence in Teaching Awards Committee

Committees Reporting to the Senior Vice President for Administration and Treasurer

Committee on Health and Safety
Committee on Security
Parking Committee

Committees Reporting to the Vice President for Academic and Student Services

Committee on Student Life and Auxiliary Services
Honor Commission
Student Activities Budget Review Board
Calendar Committee
Committee on Disabled Persons
Financial Aid Appeals Committee
Distance Learning Advisory Committee

A list of all committees and current committee members appears in Appendix 7.

D. EMPLOYEE RELATIONS

The university’s employee relations program is deliberate, participatory, and increasingly transparent, reflecting organizational maturation and strategic direction. Employment policy is progressive, evincing accountability at both the managerial level and among the employee population at large. Continual, structural assessment of operations, labor deployment, and program methodology has been necessary as a means to achieve the performance character, and resulting outcomes that support institutional mission.

In this regard, the Office of General Counsel administers the university’s merged human resource, labor relations, and legal affairs operations; formally joined as a collaborative think tank, evincing a cross-trained, employment teaming culture that the university seeks in and among its entire employment population.

Employment relations, with and among the six organized labor constituencies, have been proactive and substantively intensive, minimizing the utilization of outside consultancies, legal representation, and third party bodies of review. While there now exists more authorized avenues for challenge of institutional decisions, internal constituent bodies of review, coupled with substantively informed employment administration ahead of the complaint curve, has resulted in minimal formal legal or labor disputes. This saves financial and human resource expenditures and permits the transfer of energies and resources into creative problem-solving and collaborative employment legislation.
Six of the seven distinct university salary programs have evolved, largely through progressive labor negotiations, from longevity based, across-the-board salary programs to performance based or factored salary programs, redistributing our resources to the best and brightest.

Employment policy is under continual assessment and constructive challenge for improvements as appropriate to maximize efficacy of institutional performance. Myriad policies, both comprehensive in nature, such as the Position Classification Policy and Procedure and the Employment Processing Policy and Procedure and specific to our diversified employment population, such as “Vacation” and “Grievance” policy and procedures, have been amended and recertified as part of the recognized necessity of a continual commitment to match policy to institutional direction. A simple but significant indicator of this active participatory program is the change in the format of the collective bargaining agreements from “bound” labor contracts for a term to “3 ring” legislative manuals under constant review and occasional amendment as healthy employee relations is a 365 day institutional commitment.

A specific division within Human Resources was created to provide a continued forum for education, training, and the exchange of ideas and information concerning employment rules, regulations, and issues. Human Resources’ Division of Employment Policy, Training and Development has created and annually publishes an Employee Handbook, provides daily tutorial, issue exploration and intake, and offers a formal, ongoing training curriculum to all segments of our employee population.

The objective of the Employee Relations program is simple: an employment culture that is informed, committed, forward-thinking, collaborative, and collegial. University planning and administration is, and will continue to be, focused accordingly.

Cognizant of the myriad and ever increasing joint and severable regulatory controls and demands confronting the public research university, NJIT developed the Office of Compliance and Community Relations to oversee, in collaboration with the Office of General Counsel and the Office of the Senior Vice President for Administrative and Treasurer, proper compliance with federal, state, local and common law mandates.

From adherence with building code regulations to promulgation and administration of conflict of interest policy to technology transfer and cyberspace legal parameters to understanding of compliance with and training of workplace safety, sexual harassment, student and employee disability law, financial administration and unlawful discrimination, to name a few, the university maintains policy, periodically reviews same and takes swift and decisive action when either failure to act or inappropriate conduct or standards pertaining to any workplace regulation occurs. Legal Counsel has been brought in-house to provide an improved efficiency and economy of scale to the review of regulated programs and mandates that, daily demand understanding and attention.

E. SUPPORT UNITS AND PROGRAMS

Library

The university’s Robert W. Van Houten Library, built in 1992, supports study, research, computing, browsing and supplementary reading. The library has a collection of 160,000 volumes, including books, and bound periodicals. In keeping with rapidly changing library services, the library now subscribes to over 10,000 electronic journals, all of them
available in full text. The library also maintains a core print collection of about 1,700 current journal subscriptions. Participation in VALE (Virtual Academic Library Environment of New Jersey) has brought access to several major databases of journals at licensing fees lower than NJIT could have purchased alone. More importantly, there is significant usage of these databases, with more than 85,000 documents downloaded in the year 2000 alone. In several disciplines, such as architecture, publishers still do not provide electronic journal subscriptions. Over the next five years, we can expect the number of print journal subscriptions to decrease as more electronic subscriptions become available.

Journal literature in engineering, science, management, architecture, and other subject areas is accessible through a variety of indexing and abstracting publications and web-based databases including Compendex Web (Engineering Index from 1980 to the present), ACM Digital Library (a comprehensive resource of bibliographic information, citations, and full-text articles), Institute of Electrical and Electronics Engineers (IEEE) Electronic Library (allows the NJIT community to search IEEE conference proceedings and journal titles from 1998 to the present), Science Direct (provides the full text of journals published by Elsevier), Applied Science and Technology Index (a broad based index with abstracts covering all disciplines within engineering and the physical sciences), and UnCover, to name just a few. The library offers innovative Internet access to UnCover, a database containing citations and occasional abstracts to articles in 16,000 journal titles covering many disciplines. This service is available on campus and remotely to undergraduates as well as graduate students, faculty, and staff. Articles can be sent directly to a designated fax machine.

A key focal point is the library’s Information Commons, located on the main floor adjacent to reference services. The Information Commons provides computers with access to the Internet and a variety of library databases. A number of computers also provide access to word-processing, PowerPoint, and other services available in the other university computer labs. The Information Commons also houses VCRs for viewing videocassettes placed on reserve by faculty or by the distance learning program. Due to heavy computer usage, plans are in place for further expansion of the Information Commons. The response of the library to student needs has seen a progressive addition of study space, carrels, and active computer ports.

The library’s technical reference librarians provide individualized reference services, literature searches, and instruction in the use of reference resources. The librarians have strong subject knowledge in technology, and among them hold degrees in Industrial Engineering, Chemistry, and Mathematics in addition to degrees in Library and Information Science. The reference librarians also act as liaisons to NJIT academic departments in materials selection and assistance.

Students may supplement NJIT library resources by borrowing from Rutgers-Newark’s Dana Library, the University of Medicine and Dentistry of New Jersey’s Smith Library, Newark Public Library, and the libraries of the eight state colleges: Kean University, Montclair State University, Ramapo College of New Jersey, Rowan University, The Richard Stockton State College of New Jersey, William Paterson University, New Jersey City University, and the College of New Jersey.

Remote access is provided to the library’s services and products via the library’s homepage on the World Wide Web. Students can access the library’s Web catalog,
NJIT's information services and technology resources provide members of the university community with universal access to a wealth of resources and services available over the NJIT network and the advantages of a highly computing intensive environment. For the past 4 years, *Yahoo! Internet Life* magazine has ranked NJIT among the top 10 "most-wired" universities in the nation for the use of technology as measured by a set of indicators that include academics, student services, communications, and technology infrastructure. Students have the opportunity to experience many aspects of a "virtual university." The latest advances in telecommunications and multimedia technology enhance the delivery of courses and overall educational experience for all students. As a member of the Internet2 research consortium, students have the opportunity to work closely with faculty and researchers as new families of advanced networking applications are developed for the new millennium. NJIT has issued a PC to all incoming freshman students as a part of their tuition since 1985. NJIT also operates an on-campus PC store where all students, faculty and staff may purchase PC hardware, software. A PC maintenance facility for service and support is also available.

Computers and information technology play an important role in virtually every task performed on campus, from cutting-edge research to parking-space reservations. Computers assist in teaching and independent study, campus communications, library research, engineering, and architectural designs. Computers allow students to register for classes and choose course schedules and ask questions of academic advisors. Students can access the tools they need to design new buildings, develop complex solutions to engineering problems, or compile detailed management analyses in the computer network.

The Newark campus' network backbone connects some 4,800 nodes in classrooms, laboratories, residence halls, faculty and staff offices, the library, student organization offices, and others. The network provides access to a wealth of shared information services. Some of these include high-performance computer servers providing CPU cycles for simulation and computational research, disk arrays for storage of large data sets, communication servers for electronic mail and document exchange, databases, digital journal subscriptions, and a virtual "Help Desk." A virtual private network combined with Internet access, plus a large ISDN modem bank, extend access to campus information resources to faculty, staff, and students from anywhere, whether working at home, work, any of the university's many extension sites, or throughout the world.

Primary academic computing is provided via a distributed computing environment using the Andrew File System (AFS). Students receive a single log-on account that provides access to hundreds of UNIX and NT-based workstations on the campus network for
programming, computation, Internet access, graphics and visualization facilities, and many other applications. The Academic Computing Lab in the Student Mall has several hundred PCs for student use. Additional PC clusters are available in the Honors Center, the Robert W. Van Houten Library, the University Learning Center, and many departmental facilities.

The Office of Instructional Technology and Media Services provides several facilities used for live and taped broadcast of telecourses as well as satellite downlinks for a wide variety of video teleconferences and other educational and public service satellite broadcasts. Several interactive television studio classrooms provide distance learning among Newark, NJIT’s Mount Laurel campus and corporate education centers.

The New Jersey Center for Multimedia Research, a unique partnership between NJIT and Princeton University, has several facilities on the Newark campus for conducting its coordinated multimedia research program aimed at enhancing education and industrial competitiveness in New Jersey and the region. The center's Multimedia Production and Internet Delivery Studio is fully equipped to provide live Internet webcasting.

In addition to these extensive resources, several departments have special facilities for the support of individual academic programs, including the School of Architecture's award-winning Imaging Laboratory that provides students an opportunity to explore new media and images that alter the way buildings are visualized, interpreted, and created.

**Freshman Studies**

The Office of the Dean of Freshman Studies supports freshmen and transfer students in the successful completion of their first year of studies at NJIT. Placement exams are administered to all incoming freshman students and transfer students when necessary, to ensure that students are assigned to courses appropriate to their skill level. The Dean works closely with faculty and students to resolve academic concerns or issues and coordinates the freshman seminar and freshman academic advising programs.

All freshman students are assigned a freshman faculty advisor with whom to work during the student's first year. In most instances, advisors are assigned from the students major department. Freshman faculty advisors are specially selected for their sensitivity to the needs of freshman students and are supported by workshops and periodic updates of curriculum revisions provided by the Office of the Dean of Freshman Studies. A faculty advisor from a student's major department is also assigned to the student.

**The Learning Center**

NJIT’s Learning Center is staffed with three full time professionals and a variety of graduate students who serve as tutors and service coordinators. Learning Center staff offers a variety of supports to help students achieve academic success, making a total of 4,500 student contacts a year. The Learning Center’s modern two level facility is the home for class study groups, one-on-one subject matter tutoring, group tutoring for specific courses and instruction in study skills and test preparation strategies. The Learning Center is also home to an extensive video library of lectures and instructional tapes that are made available to students for reinforcement and to alumni for enrichment and renewal.
Residence Life at NJIT

Nearly 1,500 NJIT students reside on campus within four modern residential complexes, known as Cypress, Oak, Redwood, and Laurel. Approximately one-third of our resident students are female, and 97.5% are undergraduates. Resident students actively participate in designing residence hall environments through the community Standards Model, in which students participate in a process that helps them construct policies and practices for each building. Our residence halls feature several distinct environments, including one for Honors College students, Electrical and Chemical Engineering, a Healthy Living floor, and an Arts and Entertainment floor. Each building staff provides social and educational programs for residents and all collaborate for campus-wide events and community celebrations.

Our halls boast a student-to-resident assistant ratio of 1:30. Professional staff includes six Assistant Area Coordinators, two Area Coordinators, two Assistant Directors and a Director. There is an active residence government in each hall that reports to a central Residence Hall association. All students in residence are required to have a meal plan and may choose to dine in any one of three locations in the student center.

Career Development Services

The Division of Career Development Services (CDS) comprises the offices of Career Planning and Placement, Cooperative Education and Internships, Student Employment and Community and Public Service, and NJIT’s Alumni Career Services. All services are available to students either on a drop-in basis, by appointment, or via the Internet. CDS on-line allows users to access the division’s services, and help those who need assistance. The on-line service also has several job-related links, allowing users to browse employment opportunities in several majors and concentrations.

The Office of Career Planning and Placement offers career planning workshops, access to the Career Resources Center, career counseling, and on-campus recruitment by a wide range of prospective employers. In addition, the office maintains full-time job listings. SIGI +, a computerized career search instrument, and company information are located in the Career Resource Center. Annual career fairs are held, at which dozens of regionally and nationally-based businesses appear to develop recruitment contacts among NJIT students.

Alumni of NJIT graduate or undergraduate programs have access to a variety of career assistance services and programs provided by the Division of Career Development Services’ Alumni Career Services Program. Alumni can take advantage of individual career counseling, the Career Resource Center, NJIT Connections full and part-time employment listings, bi-weekly support groups, computerized bulletin board listings of experienced level position openings, direct employment postings on the internet, alumni mentors, and career-related workshops (e.g., resume writing, interviewing skills, networking, and job search strategies).

Cooperative Education Program

The Cooperative Education Program is an academically integrated educational option within all majors offered by NJIT. Cooperative education students alternate full-time work periods with college study after the completion of their sophomore year. Students
who have a GPA of 2.2 or above are invited to apply for admission to the Cooperative Education Program during their sophomore year. Designated faculty from each academic department review the applications to assess the level of academic achievement and to assure the completion of required core courses. Faculty then notify the Division of Career Development Services of acceptances and rejections. Prior to placement, students accepted to the program participate in an orientation that covers such topics as cooperative education requirements, resume writing, interviewing techniques, and skills for job success.

Once students are placed, they are registered for the appropriate departmental cooperative education course and are assigned a faculty advisor by their major department. During cooperative education work experiences, students attend two mandatory seminars and interact with the faculty advisors and the cooperative education professional staff. Also, all participants complete a learning contract that specifies the activities they will engage in to ensure theory and practice are integrated during the cooperative education work experience. The Director of Cooperative Education works closely with the deans and faculty: (1) to monitor the progress of the Cooperative Education Program; (2) to act in a liaison capacity with departments and faculty to promote cooperative education programs; and (3) to recommend changes to improve the Cooperative Education Program.

Employers are evaluated regarding the quality of work experiences offered and their treatment of the students. Written job requisitions are carefully evaluated to ensure that they involve major related cooperative education work experiences. Faculty advisors conduct on-site visits during which an evaluation of the quality of the work experience is made and employer supervision of the student is assessed. Through written and oral communications required as part of the mandatory career seminars and learning contracts, students report on the quality of their cooperative education placements and their treatment.

Alumni Association

The Alumni Association of NJIT, founded in 1947, represents and serves all Alumni of NJIT. The Mission of the Alumni Association is to work in partnership with the university family to promote and support NJIT to become the top comprehensive technological university in the U.S. The Association maintains a relationship with alumni providing them with a voice and a means of fellowship and growth through activities, programs, and events. An ever-growing Chapter Program and extensive Website provide Alumni with global access to NJIT. Kept informed by the Association’s quarterly publication, The VOICE, Alumni from around the world network with one another.

The Association is an independent, not-for-profit organization with a separately incorporated Board of Trustees. The Board of Trustees is comprised Executive Officers, immediate Past Presidents, twelve Trustees-at-Large (six of whom represent the six Colleges) and five Advisors. Over 40 Alumni Association committees work to support the mission and activities of the association on behalf of the Alumni.

The Alumni Association’s Financial Management Trustees, elected by the Alumni Association membership and approved by the Board of Trustees, manages a Scholarship Portfolio nearing 4.1 million dollars for the benefit of the students of NJIT.
Student Services

NJIT has a wide variety of activities, programs, events, and leadership development opportunities for students. There are over seventy student clubs and activities, encompassing cultural organizations, media groups (including newspaper, yearbook, radio station, and student magazines), athletic/recreational clubs, professional and honor societies, special interest groups, and twenty-two fraternities and sororities.

The staff of the William Hazell Center administers a diverse range of programs and activities every year. These include cultural programs (Heritage Months, Awareness Weeks), social and recreational programs (September Splash, Spring Week, Greek Week), wellness programs (National Collegiate Alcohol Awareness Week, World AIDS Day, the Great American Smokeout), and orientation programs (Miniversity, New Student Celebration Weekend).

Additionally, there are a number of leadership development activities available to students. These include involvement and leadership positions in clubs and organizations such as the Student Senate, Student Activities Council, and the InterFraternity/Sorority Council. Students in these and other organizations are offered a variety of workshops and activities to increase their leadership skills and abilities. These range from on-campus and off-campus workshops to state, regional, and national leadership conferences.

A full description of student services and activities appears in the Student Handbook in Appendix 8.

Educational Opportunity Program (EOP)

The Educational Opportunity Program (EOP) is a state funded program for New Jersey students who are educationally and economically disadvantaged. A significant match of NJIT funds are also dedicated to EOP.

The primary objective of the EOP is to provide educationally-related services to students whose educational and economic circumstances have limited their post-secondary educational opportunities. The following are some of these services offered during a six-week summer program for students entering in the fall semester:

- On-going counseling (individual and group)
- Academic advisement
- Educational and career planning
- Financial advisement
- Tutorial assistance
- Study skills classes/orientation
- Financial assistance (the amount of assistance is based on need)
- Leadership development

EOP has been in operation for 30 years. Each year thousands of students are admitted to summer academic pre-freshmen programs, preparing them for the rigors of college.
University Research Experience (URE)

The University Research Experience (URE) provides a range of technical assistance to the Educational Opportunity Program and minority students who historically have been underrepresented in M.S. and Ph.D. degree programs. Furthermore, URE enables undergraduates, as early as the freshman year, to work with faculty on research projects. In addition to helping students apply for and enroll in graduate programs, the URE staff assists students in identifying and applying for research, graduate and teaching assistantships as well as fellowships, grants, and other types of federal, state and university financial assistance. URE also provides academic support services such as counseling, career guidance and academic mentors. Non-EOP students may take their elective course as an independent study course to participate in a research project supervised by faculty.

Center for Pre-College Programs

In response to the recommendation of the Board of Overseers that a group of existing services be consolidated, NJIT’s Center for Pre-college Programs was initiated to continue to provide educational opportunities for elementary and secondary students in the surrounding communities. The center’s intervention strategies start at the middle school level with hands-on experiences, particularly in mathematics, that help to build aspirations for a college degree. Programs emphasize applied engineering principles, basic scientific and mathematical concepts, computing, architecture, and problem-solving skills. NJIT’s courses follow state and national curricular standards.

NJIT, through its existing Center for Pre-College Programs, 40,000 students have been served since 1978. The Center has enabled NJIT to continuously rank in the top 10 percent of the nation’s colleges and universities in graduating minority engineers, women comprise 55% of those participating. Of those alumni surveyed, 60% have gone on to careers in science, mathematics, engineering or technology.

The Center also encompasses a program of teacher preparation in teaching mathematics and science. NJIT helps teachers and K-12 school districts in math and science instruction, curriculum reform, and the establishment and maintenance of standards. Urban partnerships have been developed to this end. NJIT’s efforts have been recognized by the U.S. Department of Education, American Society for Engineering, and the American Association of State Colleges and Universities. Dr. Joel Bloom, Vice President for Academic and Student Services at NJIT, and Professors Howard Kimmel and Ronald Rockland were just awarded a grant for 2.5 million dollars from the State of New Jersey to expand and provide additional services within the framework of the Center for Pre-College Programs. Programs include:

Instruction, Curriculum Reform, and Standards

NJIT provides various professional development programs and technical assistance in the alignment of instruction, curriculum, and assessment with the New Jersey State K-12 Core Curriculum Content Standards (NJ CCCS). The goal is to assist schools and districts in the achievement of systemic change with a focus on implementing standards-based instruction in all classrooms. The Center provides professional development programs and technical assistance to schools and districts designed to align K-12 teaching, curriculum content, and assessment methodologies with state standards. NJIT
has established comprehensive partnerships with Newark, Harrison, Irvington, Teaneck, and Union City.

Urban Partnerships

The collaborative efforts of NJIT with local school districts, community groups, corporations and foundations, and science centers, have given us the opportunity to serve an increasing number of students and expand our programs to younger students in the elementary schools. School collaborations include teachers, parents, and administrators.

The Science Outreach Program

This program provides weekly in-class support to elementary and middle school teachers. The Program has led to teacher instructional change in keeping with both national and New Jersey State standards in teaching and learning of math and science by reaching those responsible for current and future generations of youngsters, while simultaneously impacting on the current generation of students. A unique dimension of this effort in the urban outreach is the participation of minority graduate students.

Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP)

GEAR UP is funded by the United States Department of Education (USDOE), partners with NJIT and Newark’s Camden Middle School to provide grade level cohorts of students with the necessary guidance, skills, and motivation needed to successfully complete high school and enroll in post-secondary education. Simultaneously, professional development will be provided to the teachers so that future generations of students will benefit from this program. GEAR UP collaborates with the parents, teachers, and administrators for systemic change in curriculum and instruction.

Science and Math for Special Education Populations

A National Science Foundation (NSF) grant has allowed NJIT to establish a comprehensive, long-term, training and assistance program in science and mathematics curricula for special education elementary teachers, their learning disabled, neurologically impaired, and physically challenged students, counselors and parents of the children. A state-of-the-art multi-media laboratory has been established at NJIT to provide teachers with a stimulating and attractive learning environment and to encourage them to experiment and learn.

Women in Engineering and Technological Initiative

In the 21st century, the majority of new entrants into the labor market will be women and minorities, groups that historically have not been encouraged to pursue science and mathematics based college majors or technological and engineering careers. Through its Females in Engineering initiative, NJIT’s Pre-college Center encourages post-ninth graders to enroll in advanced science and mathematics courses and to choose engineering and related careers. NSF grants have allowed NJIT to expand women pre-college programs to reach fourth through eighth grade female students.
TRIO Programs

The national TRIO (Upward Bound, Educational Talent Search, and Student Support Services) programs and activities are authorized under Title IV of the Higher Education Act of 1968 and funded through the U.S. Department of Education. NJIT conducts three of these pre-college programs: Upward Bound, Talent Search, and Upward Bound Regional Math and Science Center.

Bridging the Gap

“Bridging the Gap” serves people with disabilities as part of a $2.8 million training program from the U.S. Department of Labor. Other audiences include the under-employed, and under-represented minorities and women. Students receive eighteen weeks of IT-related training in classrooms and online and eight weeks of paid internships that lead to jobs.

Upward Bound Regional Math and Science Center

Provides high school students with an academic and summer educational experience that consists of mathematics, physics, amusement park physics, foreign language, computer programming, rocketry, optics, research projects and more. The goal is to help students develop and practice the kind of independence and self-sufficiency that will be needed to succeed in college and pursue Science, Mathematics, Engineering and Technology (SMET) careers.

Talent Search

Is designed to encourage youth to take an active interest in developing and pursuing academic, career, and personal goals. The year round program provides the students with the necessary skills and motivation needed to achieve academic success, graduate from middle and high school, and eventually enter college.

Bridge to SMET (Science, Math, Engineering, Technology)

The needs of secondary school students are met through diverse summer and academic year programs. NJIT’s Pre-College Center offers programs that pique students’ scientific interest, fill in the math and science gaps in their education, create new learning opportunities, and provide new skills, academic support and career motivation.

Other Outreach Programs

There are numerous other outreach programs, including: (1) Experimental Math, Science and Communication Program (EMSCP), a four-week summer program for post-seventh grade high achieving urban youngsters; (2) Introduction to Chemical Engineering (IChIME) Program, a three-week summer program for post-seventh and eighth grade high achieving urban youngsters; (3) Urban Civil Engineering Summer Institute (UCESI), a five-week summer program for post ninth or tenth grade high achieving urban youngsters; (4) Engineering Prep Bridge Physics Program (EPBP) - A summer and academic year program designed to increase the number of minority students who enroll and successfully complete a physics-based engineering degree program; (5) The Computing and Composition Project, a project that serves sixty Newark students in the
tenth through twelfth grades, and their teachers, from Science, Technology, Barrringer, and University High School with instruction and laboratory sessions that integrate computer programming, problem solving/critical thinking with the fundamentals of English composition; (6) Project SEED, a summer program for high achieving high school urban students that provides participants with research experiences in science and engineering under the leadership of NJIT faculty; (7) JETS/TEAMS (Test of Engineering Aptitude, Math and Science), a one-day competition involving teams of ninth to twelfth grade students who compete as a group against other high school teams in a rigorous battery of seven tests; biology, chemistry, english, mathematics, physics, engineering graphics, and computer fundamentals. TEAMS is sponsored by NJIT in cooperation with the Junior Engineering Technical Society, Inc. (JETS), which oversees similar events in 32 states; (8) Chemistry Olympics, a one-day competition designed to test the knowledge and skills of talented high school chemistry students throughout New Jersey; and (9) Academy, programs that include summer (commuter or residential) and school-year programs on the NJIT campus for academically talented and highly motivated high school students. The program offers college credit courses in architecture, chemistry, computer science, engineering design, math, and physics.

**AMP (Alliance for Minority Participation)**

The Philadelphia Alliances for Minority Participation (AMPS) Program is designed to strengthen the preparation of minority students in science, math, engineering, and related fields. In so doing, it seeks to increase the number of minority students who successfully complete baccalaureates in these fields. The long term objective of this program is to increase the number of Ph.D.’s awarded to underrepresented minority groups in these fields, and ultimately increase the number of minorities in faculty positions. To achieve this, the program helps students build partnerships between academic, professional and industry organizations, engage in collaborative learning, and develop opportunities for mentoring. NJIT has been a participating member in the AMP consortium since 1997.

Of the eight participating institutions, NJIT has graduated the largest number of minority science, engineering and math students by far, exceeding its own annual targets. Since the inception of the program, NJIT has graduated nearly 800 minority students. NJIT’s efforts with students have featured:

- Enhancement of the academic experience with research
- Accelerating seniors to graduation with summer academic courses
- Providing career services pre-job workshops
- Providing financial assistance to AMP-eligible students from the freshman to senior year

**Enterprise Development Center**

The NJIT Enterprise Development Center (EDC) is a technology oriented small business incubator founded by NJIT in 1988, in cooperation with the New Jersey Commission on Science and Technology. The EDC addresses the problems that young technology-based businesses have in obtaining appropriate technology, market information, management assistance and access to capital. The mission of the NJIT Enterprise Development Center (EDC) is to accelerate the successful development of entrepreneurial companies through an array of business support resources and services, developed or orchestrated by EDC management, and offered both in the incubator and through its network of contacts.
EDC’s main goal is to produce successful firms that will leave the program financially viable and freestanding. These incubator “graduates” create jobs, revitalize neighborhoods, commercialize critical, new technologies, and strengthen local and national economies.

Management guidance and consulting suitable for young, growing companies is critical to NJIT’s economic development mission. Our incubator program also provides clients with access to appropriate rental space and flexible leases, shared basic business services and equipment, technology support services, and assistance in obtaining the financing necessary to company growth.

Over the two-year period 1998-2000 a total of 43 students were employed by approximately six EDC companies that had need for student assistance. Employment for each student consisted of approximately 10-12 hours per week during that two-year period. Since 1997 a total of six faculty members have been a part of the management teams of five client companies. A total of 75 companies have graduated from the EDC. More than 35 companies are currently being served. Buildings for EDC II and EDC III are currently under construction, and these centers will be able to serve up to 90 businesses.

F. MOUNT LAUREL CAMPUS

In cooperation with the Burlington County College, on land provided by the freeholders of Burlington County, NJIT opened a branch campus in the city of Mt. Laurel in southern New Jersey to serve the technological educational needs of its residents. The state of New Jersey provided the resources to build the Technology and Engineering Center, a 60,000 square foot building, in cooperation with Burlington County College. This building has regular lecture classrooms, computerized classrooms, and laboratories.

NJIT offers programs as extensions to its existing programs at the Newark campus. Students can complete coursework at the Mt. Laurel campus to receive a B.S. degree in Computer Science, Computer Engineering, Engineering Technology (Electrical and Surveying), Electrical Engineering. Nursing is also offered in cooperation with the University of Medicine and Dentistry of New Jersey. Coursework leading to a B.A. degree in Information Systems is also available. In addition, students can partially initiate a B.S. in Chemical Engineering, Civil Engineering, Industrial Engineering, Management, Mechanical Engineering and Statistical and Actuarial Science at Mt. Laurel and complete it at Newark. The M.S. degrees in Computer Science, Information Systems, and Engineering Management are also available at Mt. Laurel.

Students

Mt. Laurel enrollment has grown from 185 students in 1996 to 351 in fall 2001, including 250 undergraduate and 101 graduate students, and 159 full-time and 192 part-time students. The admission requirements for students at Mt. Laurel campus are the same as for those in Newark. Both freshmen and transfer students are admitted to the programs. Transfer students are required to have an A.S. degree in a pre-engineering program from one of the colleges with which NJIT has an articulation agreement.
Faculty

The electrical and computer engineering programs have two full-time faculty at the Mt. Laurel campus. These two faculty teach and advise undergraduate students in Mt. Laurel. Both faculty members have terminal degrees in electrical engineering and extensive teaching and/or industrial experience. Qualified adjunct faculty drawn from industry in the region provide additional help in teaching and in laboratories.

The College of Computing Sciences has three full-time faculty in Mt. Laurel who are responsible for the computer science courses needed by students in all of the degree programs offered. Full-time NJIT faculty teach the upper-level general education courses. Burlington County College (BCC) faculty teaches the pre-engineering courses. The course equivalencies between BCC and NJIT have been established through articulation agreements. NJIT faculty teach the electrical circuits courses. The NJIT Dean at Mt. Laurel also serves as the BCC Science, Math, and Technology Dean and coordinates the pre-engineering program.

Administration

The programs are administered from Newark. One of the faculty members serves as the Assistant Chair. The Mt. Laurel Campus itself is administered by Dean Raghupathy Bollini, an electrical engineer who reports to Provost Van Buskirk. In addition to the Dean, there is an Assistant Dean, an Administrative Aide and the Dean’s Secretary to provide student support. The Assistant Dean provides support in the areas of student financial questions, student cooperative placement, and student placement upon graduation.

Other Support Personnel

Support personnel include a full-time customer services representative, a technical services coordinator, and an admissions recruiter. A full-time laboratory manager in Mt. Laurel coordinates all electrical and computer labs, and is responsible for installation and maintenance of the equipment. NJIT students have use of the general facilities and services at Mt. Laurel, including the library and student bookstore.

Laboratory Facilities

The Mt. Laurel campus has one multi-purpose computer and electrical engineering laboratory. This laboratory provides: 1) experiments on electrical measurements; 2) computer engineering/microcontroller lab experiments; 3) electromechanical energy conversion experiments; and 4) communication lab experiments. All measurement stations are less than four years old and the instrumentation is IEEE 488 compatible. Each station has a computer for controlling the experiments and for data acquisition.

A computer lab is also available to the students. This lab functions as a teaching laboratory and as an open laboratory. The students have access to software packages such as MATLAB and Electronics Workbench. Students use these packages for simulation and design. A fabrication lab is available to students for their senior hardware design and testing.
Financial Support

The university has provided the budget to operate the facility and to support the needs of the students, faculty and staff. The provost has supported the dean in recent acquisitions of new equipment to upgrade and maintain the laboratories in the state-of-the-art mode. In the past year alone $100,000 was expended to acquire equipment for communications experiments and electrical machine experiments.

Intra-Campus Communication

The connection to the Newark campus and programs is maintained through all the communication modes that are available. The Dean and the Assistant Chair for the ECE program visit the Newark campus at least once a month to maintain personal face-to-face contacts. The Newark Campus has an ITV room that permits receiving and transmitting distance education courses, and for having live ITV conferences between the two campuses.

G. Big Bear Solar Observatory

The California Institute of Technology built the Big Bear Solar Observatory in 1969 and operated it through 1997. After a nationwide search, management of the observatory, and an array of solar radio telescopes at Owens Valley Radio Observatory in Owens Valley, California, was transferred to New Jersey Institute of Technology on July 1, 1997. Funding for the operation of the observatory is from the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), the United States Air Force, the United States Navy and other agencies. The observatories support a $1.6 million annual research program.

The Big Bear Solar Observatory plays a critical role in the international scientific community by providing some of the world's most accurate solar data and images. The Big Bear Solar Observatory is located approximately 100 miles east of Pasadena, California at an elevation of 6700 feet in the middle of Big Bear Lake which is the world's premier site for observing the Sun and for daytime astronomy. The dedicated array of solar radio telescopes at the Owens Valley Radio Observatory is a world-renowned instrument in its own right. The observatories and equipment are valued at about $12 million. Big Bear Observatory has become a major resource for NJIT graduate students in the solar physics program.

Big Bear Solar Observatory is also the United States-based location for a global network of telescopes used by the Global Oscillation Network Group (GONG) and the Taiwan Oscillation Network (TON) projects. The GONG project is federally funded by the NSF and managed by the National Solar Observatory. The TON project is managed by the National Tsing Hua University of Taiwan. Both the GONG and TON projects are conducting detailed studies of the solar interior using the science of helioseismology. Helioseismology uses naturally occurring sound waves that travel inside the Sun to measure the internal structure of the Sun. The six-site GONG and four-site TON network obtain nearly continuous observations, and therefore eliminate the noise in the data caused by the day-night cycle. NJIT's Center for Solar Research, directed by Philip Goode (Distinguished Professor of Physics) plays a critical role in the international scientific community by providing some of the world's most accurate solar data and images through its Big Bear Solar Observatory (BBSO).
Dale Gary, associate professor of physics, is developing three-dimensional imaging techniques to determine the emission source versus height structure of transient structures in the solar atmosphere with support from the National Science Foundation (NSF). The OVSA is also studying solar noise and its effect on wireless communication. The center is building three adaptive optic systems— one for BBSO, and one each for our partners, the National Solar Observatory (Dunn Solar Telescope) and Kiepenheuer Institute (German Vacuum Telescope). Adaptive optics is the technology that allows real-correction of image distortion caused by the earth's atmosphere. The director of this project is Thomas Rimmle, NJIT research professor and associate astronomer at the National Solar Observatory, and the work is supported by an NSF grant.

The international H-Alpha Network brings together scientists from Big Bear Solar Observatory in California, Kanzelhoehe Solar Observatory in Austria, and Yunnan Solar Observatory in China to study the sun as a means of determining space weather. Haiman Wang, professor of physics, is the director of this project.

H. COMMUNITY SERVICE

Faculty, administrators, and students are engaged in a broad range of educational, cultural, athletic, and economic development activities in fulfillment of NJIT’s public service mission. Some of NJIT’s public service initiatives include:

- Activities related to the development of Newark, including participation in conceptualization of the Performing Arts Center, affordable housing, other community structures and a variety of additional Newark improvement projects. NJIT participated in the construction of the movie theater. President Fenster is the past chair of the Newark Collaborative Group and was a member of the Metro Newark Chamber of Commerce and the Regional Business Partnership.
- NJIT is a member of the Council for Higher Education in Newark (CHEN). The CHEN institutions have been an anchor in the renewal of Newark and CHEN coordinates efforts that result in economic strength, higher employment, and continuing improvement in the educational, cultural, and social life of Newark and New Jersey.
- Participation in the development of University Heights Science Park. Science Park is a collaborative venture between Newark’s higher education institutions, the city and community of Newark, and private industry. Science Park houses more than 14 research centers, conducting nearly $100 million in research annually. A new, additional facility is under construction, and expansion plans should result in the generation of 3,000 jobs. NJIT’s president is Vice Chair of University Heights Science Park.
- Participation and leadership in the development of the New Jersey and regional economy. NJIT’s president is on the Board of Directors of the Regional Plan Association and the Technology Council of New Jersey. He chairs the Research and Development Council of New Jersey, and he is vice chair of the Business-Higher Education Forum.
- Activities of the Office of Community and Public Service which links classroom theory and concepts with practical applications in the community. Projects have included:

- NJIT Literacy Corps: Through collaboration with the Newark, America Reads Partnership, 37 NJIT work-study students tutored over 350 elementary age school children at 15 schools and organizations throughout the metropolitan area. Burnett Street School, the Protestant Communities Centers after-school program, Newark Literacy Campaign, and the Newark-North Jersey Committee of Black Churchman Tutorial program benefited from our students support.

- Housing Scholars: Twenty-six New Jersey students, six from NJIT, were selected to serve as Housing Scholars at twenty-four affordable housing agencies during the summer of 2001.

- 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, the EOP and Athletics Department incorporated service-learning activities into their programs to promote civic engagement opportunities for participants. Recent projects included: an architecture student developed a renovation plan for a senior citizen daycare facility at New Community Corporation; several CIS students designed and constructed a major volunteer database for the United Way of Essex and West Hudson; for the Clifton Public Library, CIS students developed a computer training center and conducted basic internet classes for library constituents; and an EOP student interested in oral communication 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 195 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."

NJIT has a long tradition of providing policy analysis and technical assistance to public agencies as well as a history of leadership and participation in community development and improvement projects. 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 contribute to public dialogue and significantly influences state policy and decision making. Some highlights include:

- 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 user. NJIT completed a comprehensive technology survey and has organized various constituent interest groups to develop quantitative performance criteria for a “smart gun”. The findings were presented to the New Jersey Legislature’s Law
and 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 and is working with the gun manufacturing industry and Federal agencies to ensure early adoption of results. 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 a 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 that NJIT do the study. The NJIT team evaluated several alternative energy production schemes to arrive at per capita conversion costs, and quantified additional energy conservation strategies for 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.

- 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. The study also projects the future cost of congestion in the state for the years 2005 and 2015.
II. INSTITUTIONAL CHANGE AND RENEWAL

The processes associated with institutional change and renewal are central to NJIT’s rapid and successful transformation. The processes that have driven the university foster larger steps rather than management of change at the margin, and they have four underlying principles: (1) an entrepreneurial spirit, (2) a sense of urgency, (3) agility, and (4) cross-disciplinary thinking. These qualities are expressed in the scope and speed of change at NJIT.

TRENDS AND IMPLICATIONS FOR NJIT

The process of environmental scan and analysis has resulted in identification of significant trends for NJIT, including globalization of world markets, technological change, increased accountability, and increased competition. Implications for NJIT and the University’s response are described below.

1. Globalization of Educational Mission – As commercial markets have become increasingly global, the educational mission to prepare workers for these markets must also become global. This mission includes developing international educational mission and outcomes standards and extending the reach of the university to the international community to ensure that students can perform in this expanded context. To achieve a role in globalization of business, education, and political life, and to ensure entrée for NJIT students and graduates in the international sphere of activity, NJIT has taken an aggressive role in developing an international presence.

International Leadership

NJIT’s president has been instrumental in developing international contacts and forums for NJIT. He was a principal developer of the International Network for Engineering Education and Research (INEER), serves on its Board, and was the keynote speaker at its international annual conference held in Taipei in 1999. His address at the conference was entitled “Reflections on the Need to Rethink the Engineering Curriculum.” In July of 2001, he was keynote speaker at the International Conference on Collaboration Between the United States and Thailand in Bangkok and spoke on “Research and Human Resource Development in Science, Technology and Education.” Shortly thereafter, Dr. Fenster also gave a keynote address at the 2nd International Conference on Information Technology Based Higher Education and Training at Kumamoto, Japan, where he spoke about ‘Economic Development, Curriculum Change and Knowledge Diffusion.” In 1999, Dr. Fenster received the Global Award for fostering the growth and development of social, cultural and educational aspects of society from the Privadashni Academy, India.

Provost William Van Buskirk was recognized by the International Network for Engineering Education and Research (INEER) for “sustained contributions in establishing research and education linkages between the U.S.A. and India, France, Thailand, Ghana, Kenya and United Arab Emirates.” The award was presented to him at the International INEER Conference held in Oslo in August 2001.

The Newark College of Engineering, under the leadership of Dean S.T. Mau and Professors Methi Wecharatana and Daniel J. Watts, participates in a consortium of Thai universities in the development and delivery of a graduate program in environmental
management. The consortium was composed of five Thai universities, is based at Chulalongkorn University, and its goals include the development of the instructional and research programs in environmental management and environmental waste management. NJIT faculty participate in program development and research, provide on-site instruction in Thailand, and serve as international advisors to graduate students in the program.

Urs Gauchat, Dean of the New Jersey School of Architecture, has spoken at and has moderated panels at numerous international conferences. He has spoken to conferences at the United Nations on several occasions, including the Conference on Human Settlements (1996) and the conference on “Aging and Urbanization: Challenges and Opportunities” in 1998. He also moderated panels at United Nations-sponsored conferences in Zagreb, Sophia, and Budapest.

Dean of the Newark College of Engineering, Sheng-Taur Mau, who has also presented internationally, is a life-long member of the Chinese Institute of Civil and Hydraulic Engineering and the Chinese Institute of Engineers, both with offices in Taiwan. Many NJIT faculty and staff have attended and presented papers at international conferences and workshops and have published in international journals.

Prof. Roman Voronka received the Ukraine Prime Minister’s Award in recognition of his outstanding contributions to the educational and humanitarian institutions of the Ukraine in 2000. The international Humboldt Research Award was given to Dr. Men Chu Zhou in recognition of his contribution to Petri nets and computer integrated systems. Dr. Boriz Verkhovsky received the International Institute for Advanced Studies 1999 Meritorious award for his work in systems research and cybernetics.

International Educational Programs

NJIT students attend universities overseas at nine different universities with whom NJIT holds agreements, including universities in Sweden, Denmark, France, England, Australia, Senegal, Germany, Singapore and Italy. Students in NJIT’s Global Competitiveness course have visited Finland, Russia, Sweden, Argentina, Brazil, Chile, China, Japan, Singapore, Hong Kong, France, Greece, and Turkey. Contracts are currently in development to deliver courses via distance learning in several foreign countries, including nations in Asia and the Near East. NJIT offers a summer program in Germany for engineering students at the prestigious Technische Universitat Munchen. The program encompasses a language component, project work and lectures as well as visits to high-tech and traditional industrial sites in and around Munich (e.g. software firms, BMW, Siemens) as well as visits to cultural and historical landmarks in Bavaria and neighboring regions. The School of Management is offering their MBA in France.

The Henry J. Leir Chair was established to build upon the School of Management’s expertise in global business. Endowed by a $1 million gift from the Leir Charitable Trusts, the chair memorializes Henry J. Leir, a prominent chemical engineer and international industrialist. William V. Rapp, an eminent scholar in international economics, is the first holder of the Leir Chair.

International Students and Faculty

NJIT has a diverse student body, including students who reside in 124 different countries or political entities; these students bring an international culture to classes and programs.
International Research Projects

NJIT faculty are engaged in research that encompasses an international arena for many research programs. Overseas investigators and sites are involved and partner in projects. A few notable examples include:

Biological Treatment of Hazardous Waste – Research at NJIT’s York Center for Environmental Engineering and Science includes a project to develop better engineering tools for prediction of the extent of contaminant plume migration in groundwater. Led by Dr. Gordon Lewandowski, the work is being conducted in collaboration with faculty at Johns Hopkins University and the Institut National des Sciences Appliquees in Lyon, France.

Flexible Manufacturing – Dr. Layek Abdel-Malek is developing decision support systems, utilizing operations research techniques and information superhighways, in the areas of robots and robotic assembly, flexibility assessment, and e-Manufacturing supply chain. Funding is provided by the Italian Council of National Research, as well as by NSF, the U.S. Air Force and the New Jersey Commission on Science and Technology. Dr. Piero M. Armenante is studying “Fundamental Studies and Chemical Engineering Innovations in Flocculative Water Cleaning in cooperation with Dr. Michael G. Burnett, Queen’s University, Belfast, Northern Ireland, U.K. The main objective of this research is to conduct fundamental research work on the fluid dynamics of coagulation and flocculation processes for application in the treatment of water and waste water. Dr. Armenante is also working with Prof. Fabio Fava at the University of Bologna, Italy, on the exploration of the extremely long lag phases that often occur prior to the initiation of the anoxic reductive dehalogenation of chlorinated hydrocarbons. In a third project, he is studying the effect of liquid height on solid suspension in mechanically agitated vessels in cooperation with Prof. Barbara Mazzarotta at the University of Rome.

Dr. Robert Pfeffer is currently working with L’Ecoles Des Mines d’Albi on new applications for tailored particle materials.

The Big Bear Solar Observatory is working on numerous research projects in collaboration with international investigating groups, and wide international use is made of this very unique and special site for astronomical research.

2. New Models of Education – New models of education encompass the full range of available and continually emerging communication technologies. Instructional strategies are migrating from passive to active learning models, and into “convenience” modes, tailored to student lifestyles and need.

At NJIT, the innovation process is managed to develop responsive courses and programs rapidly. Using recent new program development and associated cycle time as measures, it is clear that the university is able to introduce innovations into its portfolio of degree and continuing education programs in a manner that is consistent with an emphasis on responding to technological change. It is important to note that in the development of new programs, existent faculty and courses become part of the resource to launch the
program. Examples of new program development and associated cycle times are presented in Table 3 to illustrate the agility of the process.

Table 3: Cycle Times for New Program Development

<table>
<thead>
<tr>
<th>Degree Programs</th>
<th>Time to Develop and Implement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Science in Information Technology</td>
<td>12 months</td>
</tr>
<tr>
<td>MBA in the Management of Technology</td>
<td>9 months</td>
</tr>
<tr>
<td>E-Commerce Specialization in Management</td>
<td>6 months</td>
</tr>
<tr>
<td>Bachelor's in Biomedical Engineering</td>
<td>12 months</td>
</tr>
<tr>
<td><strong>Certificate Programs</strong></td>
<td></td>
</tr>
<tr>
<td>Electronic Commerce</td>
<td>6 months</td>
</tr>
<tr>
<td>Management of Technology</td>
<td>3 months</td>
</tr>
<tr>
<td>Internet Systems Engineering</td>
<td>Less than 12 months</td>
</tr>
<tr>
<td>Object-Oriented Design</td>
<td>Less than 12 months</td>
</tr>
<tr>
<td>Biomedical Processing and Measurement</td>
<td>Less than 12 months</td>
</tr>
</tbody>
</table>

Instructional Technological Innovation

To support advances in technology mediated learning, the Teaching, Learning and Technology Initiative, a collaborative effort of the Instructional Technology and Media Services Office, the Computing Services Division, and the Robert W. Van Houten Library offers an extensive array of programs designed to develop the skills necessary to use new learning technologies. To date, 158 faculty members have attended specialized training focused on the use of learning technologies in traditional and distance delivered courses.

Perhaps the best indicator of how successful distance delivered courses have been is enrollment. At present, 163 distance delivered courses are available across 22 academic areas. The annual enrollment in DL courses, presented in Figure 9, are indicative of a pattern of strong growth over time.

Figure 9: 5-Year Enrollments in Distance Learning Courses, Spring and Fall
The effects of ongoing change are evident in the university’s rapid migration away from a heavy reliance on taped lectures in distance delivered courses to an integrated system that incorporates lectures, on-line exercises, and greater use of web-based conferencing systems. This has also led to a strategy where several web based technologies of varying degrees of complexity are available for use by faculty members, allowing an orderly progression of mastery of basic to more challenging technologies.

Recent data from the university’s on-line conferencing systems indicate that both students and faculty are engaged in distance delivered courses. Specifically, statistics from the Web Board conferencing system for the fall 2000 semester indicate that the 89 classes in which it was used generated 914 conferences and 23,418 posted messages.

Dr. Gale Tenen Spak, Associate Vice President for Continuing and Distance Education, and Distinguished Professor Starr Roxanne Hiltz were members of the design team that built New Jersey Virtual University.

3. Development of Educational, Government and Business Partnerships - New partnerships and collaborative relationships based on closer ties with government and industry stimulate economic development, provide new opportunities for teaching, research and learning, and strengthen the role and position of the university in the social and economic fabric.

From 1990 to 1999, NJIT increased its level of federal research funding by 479% (from $3,553,000 to $20,445,000). According to a study published in July 2001 by The Center (University of Florida), NJIT experienced more positive change in the ranking for level of federal funding for research than any college or university in the nation over this time period, and ranks 101st in the nation (adjusted for public/private control ranking) in federal research funding.

NJIT recognizes that it plays a special role in contributing to economic development in the state and regional economy. A regional economy represents a unique mixture of clusters that allow engagement with the world outside at a level that is sufficiently sophisticated to be global in reach. Clusters of innovation optimize crossovers among industries, research universities, and their various service providers. A bifurcated economy, however, is not healthy and it is necessary to engage as many people as possible, to boost the skills of workers generally, and particularly within the regional clusters. The study of clusters has established that universities are pivotal to innovation and economic development. In particular, a special type of university, the Scientific Technological Research University (schools like Carnegie-Mellon, Georgia Tech, MIT, NJIT and North Carolina State University - Raleigh) is a singular factor in forming and sustaining a cluster. Such schools share a primary goal to educate engineers, scientists and managers for industry and their central mission is to create, promote and advance technology and science. They are the natural home for business incubators like NJIT’s Enterprise Development Center that has launched over 75 successful new high-tech firms. While New Jersey now ranks first in industry research and development per capita, it ranks 40th in academic research and development per capita. It has been established that universities are pivotal to innovation and economic development, and we must bring these two rankings into alignment at the top level. NJIT’s long-term research not only builds on its existing strengths in academic programs, but squares with the
technology base for the state’s economy. The principal focus areas are: applied life-science and biomedical engineering, advanced materials and processes, environmental studies and sustainable systems, information technology, and transportation systems. These reflect the needs of an industrial sector rooted in advanced telecommunications, and pharmaceuticals. The research programs balance industrial progress through technological innovation with preservation of natural resources and attention to civil infrastructure and quality of life issues.

Collaborative relationships and partnerships spark organizational renewal through the shared knowledge that comes from joint ventures. NJIT has developed innovative, collaborative relationships to meet this general objective. The university has taken a leadership role in developing a new model of doctoral education with its collaborative Ph.D. programs. The collaborative Ph.D. is based on alliances with partners in industry that allow students to focus on applied problems in industrial settings using state-of-the-art technologies and facilities. Students are sponsored by their employers, which allows them to continue with their careers, partly with the use of distance delivered courses.

This program addresses the critical shortage of Ph.D.’s in engineering and the applied sciences while providing tangible benefits to students and their sponsors. At present, NJIT offers the collaborative Ph.D. in the following areas:

- Biomedical Engineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Computer Science
- Electrical Engineering
- Environmental Science (joint degree with Rutgers-Newark)
- Environmental Engineering
- Information Systems
- Materials Science and Engineering
- Mechanical Engineering
- Applied Physics (joint degree with Rutgers-Newark)
- Transportation

In order to further facilitate knowledge transfer, NJIT has entered into collaborative relationships to provide customized corporate training to New Jersey based companies and government agencies. These programs begin with a needs analysis and are designed to address specific issues within a given company or industry both as an avenue for economic development and as a means of maintaining intellectual currency. As indicated in Table 4, in the last five years, 25,184 New Jersey employees participated in 228 courses delivered on-site in disciplines that include manufacturing, engineering, information technology, management, and science and technology.
Table 4: Enrollment in Customized Training Courses

<table>
<thead>
<tr>
<th>Year</th>
<th>Trainees</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>2951</td>
<td>18</td>
</tr>
<tr>
<td>1997</td>
<td>3958</td>
<td>48</td>
</tr>
<tr>
<td>1998</td>
<td>5703</td>
<td>57</td>
</tr>
<tr>
<td>1999</td>
<td>6028</td>
<td>58</td>
</tr>
<tr>
<td>2000</td>
<td>6544</td>
<td>47</td>
</tr>
</tbody>
</table>

NJIT has developed innovative partnerships and collaborative relationships with industry as part of its mission driven focus on economic development. The nature of these collaborative efforts are based on the premise that all partners contributing to economic development in the region (research universities, technology-based business and government) must work together to produce desired outcomes. They are also based on the realization that NJIT will be held accountable beyond traditional deliverables to a new set that includes new R&D driven products, new jobs, and new business creation.

4. New Models of Management - Greater accountability as well as increased immersion in the cultures of industry and government through joint projects have heightened focus on strategic priorities, management practices, project focus, and institutional identity.

An examination of successes and failures in the migration to an e-business model, indicates that the challenge companies face is not in deciding which technologies to adopt, but rather in developing the appropriate policies and procedures to respond to the benefits and challenges of a “wired” world. Customer relationship management involves using the communication and database capabilities embedded in e-business technologies to enhance the experience that customers have when interacting with an organization. Knowledge management is associated with capturing and disseminating the collective expertise embedded in an organization so that it can be leveraged to drive process improvement and innovation.

Beginning with students, clearly NJIT is “wired.” Web enabled technologies currently offer a wide array of services to students including on-line registration, grade distribution, book ordering, course management, advisement, and full use of library services including requesting books and searching an extensive array of databases. Students are also given e-mail accounts and considerable storage space for a home page. A similar array of services is available for faculty. They are able to print journal articles from the desktop, check enrollment in their classes and complete required annual summary of activity forms on-line.

Furthermore, a lesson that has emerged from e-businesses is that the web has opened up lines of communication to the point where organizations have become increasingly boundaryless. This notion of “boundarylessness” underlies General Electric’s sustained competitive advantage which was attained by opening up conversations with a broad array of stakeholders. The web has further enabled this process at companies like GE, Boeing, and Apple. Presently, NJIT has leveraged its extensive IT infrastructure to engage students and faculty, and opportunities for alumni, industrial partners and other stakeholders can continue to grow. Lessons from e-businesses suggest that NJIT needs to continue to develop innovations associated with engagement to further break down boundaries for stakeholders.
III. INSTITUTIONAL EFFECTIVENESS AND OUTCOMES

ASSESSMENT OF INSTITUTIONAL EFFECTIVENESS AND OUTCOMES AT NJIT

NJIT’s program of monitoring and improving institutional effectiveness and academic outcomes is the product of the long-standing and fundamental belief of its leadership in the utilization of information and data in the educational process and for management and strategic decision-making. Mechanisms to identify, collect, store, analyze, and use appropriate information and data have been built into the university culture and are viewed as consistent with the scientific processes that characterize the disciplines of a technological, scientific, research environment. The university disciplines, as well as principles of good management, have this common basis of data- and information-based decision-making.

As a Middle States Association Commissioner, NJIT’s President has a special interest in promoting the importance of outcomes assessment. NJIT was a key player in New Jersey’s development of assessment criteria, and numerous faculty and staff worked with state Commission on Higher Education offices in development of the state-wide outcomes assessment plan that was used in the 1970’s and 80’s. NJIT was also a participant in developing New Jersey’s current system of performance-based funding. As part of its commitment to establishing and using quality institutional and extra-institutional data warehouses, NJIT hosted the regional training sessions for the newly-instituted, electronic IPEDs data base held in August 2000, which was attended by 92 representatives from colleges and universities from New Jersey, New York, and Pennsylvania.

Assessment strategies have been developed that respond to the needs of policy-makers and committees who set goals for the academic performance of the university as well as for classroom instruction. The platform for action on results is part of the total program, so that the relationship of goals, effectiveness and outcomes research, and action are integral parts of the same program, as illustrated in Figure 10 below:

**Figure 10: Assessment Process**

Originating Policy-maker or Body

Goals

Monitor Assess Benchmark

Action
NEW JERSEY PERFORMANCE-BASED FUNDING

The State of New Jersey instituted performance-based funding for higher education in 2000, pursuant to which NJIT is monitoring and providing data to the New Jersey Commission on Higher Education on a specific set of performance indicators that include:

- Graduation rates
- Improved transfer and articulation
- Improved efficiency and effectiveness
- Diversified revenues

In 2001, NJIT achieved a score, based on 9 specific measures, of 93.8% (percentage also indicated state funding level from a specific performance based pool). A copy of NJIT’s current performance-based report appears in Appendix 9.

KEY PERFORMANCE INDICATORS

NJIT’s President initiated the most recent strategic planning process in spring 1999. A strategic planning retreat was conducted by Provost Van Buskirk in summer of 1999, where a set of key performance metrics was developed and is maintained for regular review at the Deans’ Council, the Committee on Academic Affairs, and in the planning process across the university. The key performance indicators as well as their status and goals for 2005 are shown in Table 5:

Table 5: Key Performance Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Actual</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - Year graduation rate</td>
<td>37%</td>
<td>40%</td>
</tr>
<tr>
<td>Freshman to Sophomore retention rate</td>
<td>81%</td>
<td>80%</td>
</tr>
<tr>
<td>Year 2 retention rate</td>
<td>70%</td>
<td>68%</td>
</tr>
<tr>
<td>Externally funded research expenditures</td>
<td>34.06M</td>
<td>34.81M</td>
</tr>
<tr>
<td>Number of Ph.D. graduates</td>
<td>46</td>
<td>37</td>
</tr>
<tr>
<td>Number of Ph.D. disciplines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total enrollment</td>
<td>8133</td>
<td>8191</td>
</tr>
<tr>
<td>New freshmen</td>
<td>623</td>
<td>621</td>
</tr>
<tr>
<td>Mean SAT score</td>
<td>1111</td>
<td>1145</td>
</tr>
<tr>
<td>Student satisfaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time faculty</td>
<td>358</td>
<td>362</td>
</tr>
<tr>
<td>Percent female enrollment</td>
<td>22.8%</td>
<td>23.4%</td>
</tr>
</tbody>
</table>

* institutional student satisfaction survey initiated in 2000

REORGANIZATION OF INSTITUTIONAL RESEARCH AND PLANNING

In the late 1990’s, the President redesigned the Office of Institutional Research and Planning (IRP) to support the strategic planning process and to improve and expand performance monitoring and assessment activities. The Office of Institutional Research and Planning was reorganized under the leadership of Dr. Martha Zola, the Executive Director appointed in 1999. Reporting to President Fenster, the Office now includes, in
addition to Dr. Zola, Dr. Perry Deess, Director of Institutional Research, Dr. Vladimir Briller, Director of Outcomes Assessment, and Dr. Raymond Calluori, Senior Institutional Research Analyst, as well as clerical and technical support staff.

**OFFICE OF INSTITUTIONAL RESEARCH AND PLANNING (IRP)**

Components of the Institutional Research and Planning Program include:

**Strategic Planning Support**

The office has provided data support for all sub-committees of the Middle States Steering Committee charged with developing strategic priorities. The charge to committees included the standard of data-based conclusions and data-based plans for the future. Data were extracted from institutional systems, allowing examination of longitudinal trends, and original research was conducted to answer specific questions raised by committees and individuals. Strategic planning, including monitoring progress on goals and objectives, is an ongoing process at NJIT.

**Institutional Research Studies**

Studies are regularly conducted that address institutional-level questions and issues. An example of recent institutional research projects include a multiple-regression analysis to identify factors that drive student retention, and factors that place students at-risk for graduation. This important study established the importance of student academic preparation, academic performance, and student commitment to subsequent student persistence in the freshman to sophomore year. The first-time, full-time freshman cohort of fall 1999 will be followed for 6 years to examine factors affecting retention and graduation over time.

A second example is the support provided for the faculty assessment of administration completed in spring 2001. The faculty assess administrators every three years, as specified in the *Faculty Handbook*. All faculty were asked to complete assessments of their Chairs, Deans and the Provost and results were provided to all of those assessed, their supervisors, and summary results were provided to the Faculty Council.

Appendix 10 contains the list of all IRP studies, which are available in the IRP office.

**Performance Indicators, Accountability Reporting, and Accreditation Preparation**

Accountability reports prepared by the IRP office include all reports on institutional performance to government offices and agencies, and accreditation and other public, not-for-profit entities. In addition, IRP completes surveys conducted by for-profit publications that serve the public with information about higher education opportunities. Data accuracy, consistency, and quality are monitored to ensure appropriateness and integrity of all data submitted to describe NJIT, and this includes facilitation of data validation and data development procedures within NJIT systems that allow response by NJIT. The IRP office also provides support for programs preparing for accreditation reviews.
Survey Research

NJIT is a student-centered university. This commitment requires routine gathering of student goals, opinions and suggestions as well as monitoring academic progress. To ensure that this objective is met, the following surveys are routinely conducted:

**Course evaluations** – students complete course evaluations on all courses, both traditional in-class and distance learning courses, for the fall and spring semesters. Items on the evaluation cover faculty effectiveness on a variety of indicators, adequacy of facilities and resources, and a self-assessment by the student of the student’s performance and expectations. Results are used in evaluations of faculty, for faculty development, to advise in making faculty assignments, and in considering faculty for awards and honors.

**Enrolling student survey** – conducted among all FTFTF students, this survey captures student expectations, goals, objectives, characteristics, and marketing data.

**Student satisfaction survey** – conducted among a representative sample of all students, students are asked to rate the importance to them, and their satisfaction with, over 35 aspects of academic and student support services at NJIT. The composite score has become one of the institutions key performance indicators. Results have been used to pinpoint areas needing improvement, and initiatives instigated by reports have resulted in improved scores.

**Graduating student survey** – students are surveyed at the time of graduation and they are asked to assess the academic and student service aspects of their experience at NJIT.

**Alumni survey** – alumni are surveyed every 3 years and they are asked to assess the NJIT experience in view of their careers and quality of life. They are also asked to report on career development, jobs, salary levels, and positions to help us in tracking alumni success and needs.

**Employers of NJIT graduates** – employers of NJIT graduates are surveyed every 3 years. They are asked to assess the business climate and the performance of NJIT graduates on the job. They are also asked to provide information on skills and abilities they require in their employees and they measure NJIT employees against these standards.

**Faculty assessment of faculty development workshops** – faculty routinely assess the effectiveness and relevance of university faculty development workshops.

**Ad hoc surveys** – numerous surveys are conducted at the request of a specific group or individual for planning purposes. Examples, in the past several years, include surveys of student athletes for the Senior Administrator of the Athletics, Intramurals, Physical Education and Recreation, student assessment of the freshman seminar for the Dean of Freshman Studies, service assessment for the information systems managers, the library for the library director and his staff, surveys of parent and teacher needs for the Gear-up community outreach program, and academic program-specific reviews. A survey of faculty was conducted for the Middle States sub-committee (and other sub-committees) on faculty.
Teaching and Learning Outcomes Research

A comprehensive, institutional program of teaching and learning outcomes assessment research augments research conducted at the department and individual faculty level. The outcomes assessment program includes the following components:

Support for the Review Committee for Department and Program Assessment

The Review Committee for Department and Program Assessment is chaired by the Provost and has oversight for all accreditation reporting and for regular, periodic review of all programs not included in regular accreditation review activities. Guidelines for program reviews have been developed and can be found in Appendix 11. Programs are reviewed formally once every 6 years, and the rotating roster of review appears in the guidelines. The Director of Outcomes Assessment provides all data support for committees for deliberations and for preparation of reports. Data provided for these reports routinely includes data on retention, graduation rates, student grades, and other student academic achievements and program-specific student feedback.

Special Studies on Student Teaching and Learning Outcomes

**FED** – A study was conducted among faculty teaching the first year course in Fundamentals of Engineering Design to determine the effects of a new approach to teaching design fundamentals. The approach featured interdisciplinary applications, problem-solving based learning, and team teaching. Results showed positive gains for students using this approach, and the research has assisted in applying the methodology further to instructional strategies generally.

**Barrier courses** – A study was conducted examining passing rates for students in entry level, discipline-specific courses as well as for general university requirement courses. Analysis showed that for discipline-specific courses, the appropriate solution was faculty development and that for general university courses, content, sequence and instructional strategies needed general review, and these reviews are underway.

**Evaluation of distance learning and face-to-face courses in electrical engineering** – this study compared student performance in the next-level course for students completing each type of instructional experience.

**Placement examinations** – A full review of the placement examinations and cutoff scores is in progress for math, English and chemistry. This includes assessment of seven examinations that are currently in use.

**Fundamentals of Engineering Examination preparation** – this research includes the development of a program and testing to prepare engineering students to succeed in passing the FE professional examination. This involves working with engineering faculty on a comparable, reliable, valid preparation course test.

**Mechanics 234/235** – this study compared two cohorts of NCE students who took Mech 234/235 using different teaching strategies. The revised strategy improved student retention, performance, and subsequent course performance.
Support for Faculty-Driven Outcomes Assessment Research

Faculty-driven research on learning outcomes is widespread at NJIT, and many researchers have done landmark research and have published on learning outcomes. This includes work by Roxanne Hiltz and Murray Turoff (distance learning), Fadi Deek (computer science), John Carpinelli (electrical engineering), Angelo Perna and Deran Hanesian (chemical engineering), Beau Farmer (physics), Geraldine Milano and Eugene Golub (statics and dynamics), Ronald Rockland (circuits analysis), Norbert Elliot (writing), Robert Lynch (writing), Nancy Coppola (Humanities and Social Science), and others. The Director of Outcomes Assessment provides technical support and institutional data when this is helpful or useful for individual faculty study of outcomes, or for institutional projects, such as the Gateway Coalition (a national project studying engineering instruction reform).

Numerous assessment strategies are routine across the university within programs. Most programs, for instance, have a capstone course in place. In addition, formal practices to identify teaching objectives and methods of assessing student learning are also widespread within programs and disciplines, and the Office of Institutional Research and Planning routinely provides assistance to faculty in faculty-driven assessment projects. Core competencies, such as writing, math, and computer literacy, are regularly assessed within the framework of assessment of student performance. Specific measures and procedures are discussed and are available in accreditation and program review reports and at the department and program level.

Grant Support

IRP develops information for investigators in preparing grant applications. In addition, the office designs, manages, and reports on components of grant activity that include evaluation and outcomes assessment.

Other Outcomes Research

In addition to the categories of assessment research already cited, it is worth noting that numerous additional studies have been conducted by individuals with program oversight, and these have contributed to academic and management decision-making. As an example, an annual residential life survey is conducted among residential students, using a nationally based survey, comparing results against national norms for student assessment of residential life. Gourmet Dining Services, NJIT’s food caterer, conducted a survey in 2000 among students to determine how they could improve student satisfaction with food services. These results were use to implement changes that did result in improved student ratings of the food services.

In summary, the process of setting goals, monitoring outcomes, and acting on results of assessment are built into the fabric of academic life at NJIT. Assessment is widely used for strategic planning and academic decision-making. Reports have been issued on all aspects of the program described and reports are routinely stored in the Office of Institutional Research and Planning for use by members of the university community. These are also available to the members of the Middle States visiting team for review.
IV. ACTION TO ADDRESS 1997 PERIODIC REVIEW RECOMMENDATIONS

The Middle States reviewers in 1997 commended NJIT “for continuing to develop as a result of planning over 25 years,” and they agreed that NJIT was substantially moving forward on the 1992 strategic plan. The report also concluded that budgeting has been prudent and progressive, allowing solid advancement toward the stated vision of the future. The four-fold increase in the endowment that had been achieved by 1997 was also commended, as was the dramatic growth of funding to support research. Success was noted regarding the recruitment of minority students as was the sustained effort in recruiting minority faculty. The School of Management was commended for achieving accreditation status.

It was noted that the new governance structure for higher education in the State of New Jersey, coupled with NJIT’s legal status as a “public research university,” provides an opportunity for increased autonomy.

The following progress can be reported on 1997 recommendations:

1. **Be sure that faculty as well as teaching assistants are fluent in English and are comfortable in engaging students in dialogue. An entirely lecture style of teaching is no longer acceptable to students in many parts of the U.S. today. Provide opportunities for faculty development to address these areas.**

The ESL Program, which is part of the Humanities and Social Sciences Department, has developed a comprehensive approach to training teaching assistants from abroad. It begins with a one-week Teaching and Communication Skills Workshop in August, offering extensive practice in speaking English for teaching purposes. The Workshop was established originally eleven years ago by the late Dean of Student Services Connie Murray and is for entering international graduate students with assistantship offers (GAs and RAs, as well as TAs.) About 40 students, from most departments at NJIT, attend this workshop each year.

The Workshop includes an evaluation of students’ English speaking skills to determine who needs additional language training. This evaluation produces a list of students who need an initial course, Advanced Spoken English for International Teaching Assistants (ENG 503), prior to receiving non-ESL TA training (in ENG 599). ENG 503 is basically a language course. All TAs on this list and any GAs on this list who are to be assigned instructional responsibilities (tutoring, grading) are required to take ENG 503. Compliance has been good, at about 90% for most departments. GAs with no instructional responsibilities, as well as RAs, are strongly recommended but not required to take ENG 503. That is why students from Transportation Engineering, for example, who are on the list may not enroll in ENG 503.

University Teaching Methods/Communication Skills (ENG 599) focuses not on the English language but on pedagogy and related social and cultural issues. Offered each semester through the HSS Department, it is for all new TAs (international and domestic.) The purpose of ENG 599 is to enhance the quality of undergraduate teaching at NJIT by improving the teaching methods and communications interpersonal skills of Teaching Assistants as they fulfill their teaching responsibilities. ENG 599 is useful for all TAs
(international and domestic) who are graders, tutors, laboratory assistants, recitation leaders, or classroom teachers.

Those international TAs who are required to enroll in ENG 503 take ENG 599 in the following semester. International TAs not required to take ENG 503, as well as domestic TAs are required to take ENG 599 immediately.

An extensive program of workshops and training programs is available for faculty for the development of pedagogical skills. Courses vary from specific technical skills, such as building websites, to integration of technology in instruction, to instructional strategies (such as problem-based teaching). In addition, master faculty are recognized and serve as models and mentors for instructional effectiveness. A full discussion of faculty pedagogical development, as well as a description of courses and faculty evaluation of workshops appears in the later section on faculty issues and trends.

2. Continue to build on the success of increasing the percentage of U.S. graduate students.

The proportion of international students at the graduate level continues to be high (40.3%). The attractiveness of NJIT to international students and the opportunities available in the economy in the region to its residents impact the enrollment figures, particularly at the PhD level (68.3%). The latest Summary Report (for 1999) from the National Science Foundation indicates that, in engineering, 53.6% of all Ph.D. recipients nationally went to non-citizens or to those of unknown citizenship. The majority of Ph.D. students at NJIT are in programs within the Newark College of Engineering.

The presence of a large international graduate student body is consistent with the mission of preparing students for a global economic and social environment. In fact, many of the Ph.D. graduates choose to remain in the United States and become part of the American workforce. Nonetheless, efforts to attract more American graduate students are continuing. NJIT awards the Provost’s Fellowship to out-of-state graduate students to defray the difference between out-of-state and in-state tuition. The BS/MS program allows students to take 6 credits in the undergraduate program which are graduate level, and which may be counted toward the graduate degree. Students in this program can be tracked to a 5-year rather than a 6-year completion of the master’s degree, and many students have taken advantage of this program. The McNair program encourages American minority students to enroll in graduate programs.

The admissions office has tried numerous strategies to attract additional American students, such as targeted poster distributions, targeted mailings on special programs, special funding programs, and building relations with other colleges and university student advisement offices. Additional measures have been taken at the program level to help encourage enrollments of American students.

3. We suggest that an effective and practical laboratory improvement plan be developed including funding sources. This plan should indicate which laboratories are used by undergraduates.

In fall 1998, the Board of Overseers of NJIT recommended a review of lab facilities by industrial experts. The review was carried out department by department in late fall and winter. One to two industrial experts and a team chair, which organized the review team,
conducted each review. A written report was submitted in early 1999 and presented to
the Board of Overseers. Based on the review, an action plan was developed and has been
carried out in subsequent semesters.

4. Maintain a balance between scholarly work or research and quality teaching. Has
research had an effect on teaching loads and is the Institute satisfied with current class
sizes?

At NJIT, the relationship between research and excellence in teaching is viewed as
crucial. Therefore, faculty are encouraged to continue and excel in research activities as
well as in instruction. Research activity helps to ensure the currency of curricular
materials, and also provides opportunities for students to participate in the research
process.

NJIT has been able to balance research and class size issues. As was indicated in the
response to the PRR Review, no increase in class size has occurred with the increase in
research funding levels. Class size was one component of the U.S. News and World
Report ranking of NJIT as 30th in the nation on faculty resources. In student assessment
of courses, no comments have emerged that cite class size as a problem or an issue and
the overall ratings of instruction by students on course evaluations is consistently high
(from good to excellent). The overall quality of instruction continues to be among the
highest ranked sources of satisfaction for students at NJIT.

5. The size of the library collection seems small. The increase in book volumes thirty-
four percent over the past five years is commendable and is in the right direction, and
the library services of “distance learners” is being met.

Book volume has continued to increase. The library also now subscribes to over 10,000
electronic journals, and hard copy, electronic, and inter-library access to resources has
increased dramatically. Students and faculty express high satisfaction with the library
resource in student and faculty surveys respectively, especially with the helpfulness of
staff and access to needed resources. They also indicate a perceived need for more hard-
copy books, although they agree that access to on-line and electronic materials is very
satisfactory. The strategic plan includes the goal of continuing to increase the number of
volumes, as well as storage space for books in the library.

6. Efforts to increase NJIT’s visibility and recognition by media need to be sustained.

Important new resources have been added to NJIT’s campaign to sustain and increase
visibility, and a full strategic plan for increasing NJIT visibility has been completed (see
Appendix 12). Staff and functions in this area have been substantially increased, and a
larger budget for staff, advertising, promotional materials, and for activities in support of
institutional visibility, including conference attendance by senior staff and faculty,
demonstrate a new level of commitment to visibility. A marketing benchmark study was
conducted in spring of 2001 to provide baseline data for efforts in this area. Ratings for
institutional reputation continue to increase. The activity, issues, and plans in support of
the institutional effort on visibility are fully described in subsequent sections of this
document.
7. Though progress has been made in the area of outcomes assessment, it is desirable to demonstrate how outcomes are coupled with goals.

All assessment research activities, including outcomes assessment, benchmarking, and monitoring, are based on the goals and objectives of specific programs or initiatives. Outcomes assessment activity is initiated at the request of faculty or staff in order to monitor goal achievement, including student learning. In each instance where assessment is performed, it is possible to identify the initiator and the goal and/or objective of interest. This relationship is discussed further in the chapter on Institutional Integrity and Outcomes Assessment. In 1997, a Director of Outcomes Assessment, Dr. Vladimir Briller, was appointed, and it is part of his responsibility to develop and maintain a full program of learning outcomes assessment in collaboration with faculty, administrators, and staff. His program is more fully described in the Chapter III.

8. The impact of movement from scholar-athlete NCAA Division III status to Division II should be monitored.

With the move to Division II, NJIT has instituted several departmental changes to aid the student-athlete:

- Every student-athlete attends an orientation meeting at the beginning of the school year. This meeting addresses the academic support available within the department and on campus (learning centers, computer labs, etc.).
- A full-time compliance officer monitors the academic progress of all student-athletes.
- A student-athlete advisory committee has been established to foster camaraderie and address the concerns of student-athletes.
- Speakers to lead student-athlete sessions are being recruited on such topics as stress management, mental preparation, nutrition, etc. Student-athletes will participate in selecting workshop leaders on issues of concern or interest to them.
- Surveys have been prepared for administration to monitor student feedback as the program develops.

In addition, enrolling student surveys now include items to collect data on the role that the athletic program plays in attracting students. The student satisfaction survey will capture data on the impact of the athletic program on the culture of the university generally.
V. ORGANIZATION OF SELF-STUDY AND STRATEGIC PLANNING PROCESS

PRESIDENT’S STRATEGIC PLANNING INITIATIVE

The strategic planning process is an ongoing activity at NJIT. The outline and schematic illustrating strategic planning and long range planning activities, originating in 1972, appear in the 1992 strategic planning document. The process was updated in the 1997 Periodic Review Report. Analysis has revealed that goals and objectives set in 1992 and updated in 1997 have, for the most part, been met. In 1999 President Fenster initiated a new strategic planning process to further advance the university.

President Fenster determined that the 2002 Middle States Self-Study would be a comprehensive report that encompassed the strategic plan for the next 5-10 years. He charged senior administration with implementing the process, and he oriented and prepared participants at the Provost’s Strategic Planning Retreat in summer of 1999.

A strategic planning exercise addressing academic areas was initiated by Provost Van Buskirk in the summer of 1999. Discussions and analyses focused on academic programs, faculty development and instruction, research, libraries, and ongoing development of technology for instruction, communications and operations. The role of outcomes assessment for management of these issues was highlighted and strengthened. The retreat included review of: (1) mission and vision statements, (2) an environmental scan, (3) progress reports and planning proposals from the deans of the five colleges, including the dean of the Albert Dorman Honors College, (4) assessment of milestones, and (5) benchmarking exercises. The retreat resulted in the development of the university’s key performance indicators (see Table 5, chapter III), and identification of five areas for further programmatic development at NJIT, including:

- Information technology
- Bioengineering and applied life sciences
- Environmental studies and sustainability
- Advanced materials
- Transportation

It was determined that the self-study and strategic planning process would encompass four components: (1) a review of the current status of NJIT in meeting goals and objectives outlined in the 1992 strategic plan and the update of those plans completed in 1997, with a summary of current strengths and opportunities for improvement, (2) the development of responses to key questions posed by each of the subcommittees investigating the fundamental academic and functional areas of university performance, (3) the development of strategic goals and objectives associated with the key academic and functional areas of the university, and (4) the development of strategies and recommendations to enable NJIT to reach stated new goals and objectives.

The Middle States Steering Committee was formed in 1999. Co-chairs Dr. Martha Zola, Executive Director for Institutional Research and Planning, and Dr. Robert Lynch, Professor of English and Chair of the Faculty Council, were appointed. The university committee structure includes a Long Term Planning Committee, chaired by President Fenster. Many members of this committee were placed on the steering committee or one
of its subcommittees. For the purpose of conducting the work of the self-study and to develop the strategic plan, an organization consisting of ten subcommittees and three task forces was established. The work plan and timetable as stated in the Middle States Self-Study Design document were followed. The progress of the Middle States self-study was reviewed with the Board of Trustees on a regular basis, both formally, at meetings of the Board of Trustees, and with the Board of Overseers and within the context, when appropriate, of the work of individual subcommittees. A list of all subcommittees and task forces, committee structure, committee members, charge to the committees, and work plan can be found in the Middle States Self-Study Design appearing in Appendix 13. A copy of the Middle States Institutional Profile appears in Appendix 14.

The committee structure is shown in Figure 11.

Figure 11: Middle States Committee Structure
VI. DEVELOPMENTS, TRENDS AND ISSUES

A. MISSION, VISION, GOALS AND OBJECTIVES

Progress on 1992 goals and objectives was carefully reviewed and reported in the 1997 Middle States Periodic Progress Report. Developments since 1997 have been assessed in the current strategic planning process to ensure advancement that moves forward to the next level.

The strategic planning process has included a review of the mission and vision statements in light of developments, shifts in the higher education environment, and the economic and social challenges that have become integral to the role and service provided by the university. After careful analysis, consensus was reached that the mission statement, as it appears in 1992 and 1997, and earlier in this report, continues to represent NJIT’s understanding of its mission. (See Chapter I for a copy of the mission statement.)

The vision statement was renewed and improved in 2000 by the Middle States Subcommittee on Mission and Goals. The statement became more focused and concise, emphasizing the educational, economic development, community service and cultural vision for the university. It closes with statements that strengthen the commitment to students and the importance of student success as the chief index of university effectiveness. The renewed vision statement was shared with the university community and was established as a guidepost for the development of goals and objectives for the next five to ten years.

2001 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. Its 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. Increasing numbers of NJIT faculty and staff will view students’ success as the measure of their own effectiveness.

Goals and objectives for all aspects of the university strategic plan emanate from the mission statement and should be tested against this vision statement.

B. Administration, Organization and Governance

Numerous changes in the administration and organization of NJIT have been made since 1997 to reflect growth and development and in order to continue to improve the agility and robustness of the university in meeting goals and objectives.

The College of Computing Sciences was added as the sixth college of the university in the fall of 2001. The creation of the college was a response to the growing presence and expertise of NJIT in computing sciences in the state, nationally, and internationally. Enrollments at NJIT in computing sciences had reached an all-time high of 28% of student enrollments university-wide. The new structure provides an organization that will enhance the focus and development of computing sciences education and research. The Departments of Computer Science and Information Systems and the Information Technology Program comprise the College of Computing Sciences. A new Dean of the College of Computing Sciences, Dr. Stephen Seidman, was appointed in June 2001. As part of the reorganization of the the university, the Department of Chemical Engineering, Chemistry, and Environmental Science, which is housed in the Newark College of Engineering, has been restructured and renamed the Department of Chemical Engineering. The Department of Chemistry and Environmental Science has been established in the College of Science and Liberal Arts. A new Dean of the College of Science and Liberal Arts, Dr. Mill Jonakait, was also appointed.

The position of Vice President for Technology and Development has been changed to that of the Vice President of Research and Development to better reflect the duties and responsibilities of the Office. The Office of Research and Development fosters a collaborative research and development partnership among academic, governmental and industrial entities. The operation spans the functions that support traditional faculty-initiated, grant-sponsored research to newer enterprises for the university, including contract project work, intellectual property management, business initiation, and business assistance programs. These activities cover the spectrum from basic scientific research through full commercialization and make a direct contribution to the university's four mission elements. The Office of Research and Development includes institutional
offices, NJIT contract development centers, affiliated not-for-profit organizations and NJIT applied research centers.

University Advancement was reorganized to encompass a new key role in promoting the visibility of the university's achievements.

Computing Services were reorganized in 1999 to strengthen the focus, quality of services, integration of resources, and planning relative to NJIT’s technology resources. David Ullman was appointed Associate Provost for Information Services and Technology and Chief Information Officer.

The roles of institutional research and planning have been reorganized as described in Chapter III.

Based on the new statutory provisions of the NJIT Act, the size of the Board of Trustees was increased from ten to fifteen members. Mr. James A. Kennedy became the new Chair of the Board of Trustees in fall 2000.

C. STUDENTS

Enrollment

Data presented in the NJIT overview section summarizes changes, including growth in undergraduate and graduate enrollments, increased proportion of residential students, and better prepared students. A full enrollment management plan was presented in the 1997 Middle States Periodic Review Report. Enrollment continues to rise. Stated enrollment target goals of 8,000 were exceeded in fall 2001, when headcount enrollment reached 8,862. An additional goal was to maintain a minimum undergraduate enrollment of at least 4,926; the actual enrollment was 5,698 in fall 2001. The plan included maintenance of a minimum of 3,076 graduate students; actual enrollment was 3,164. The enrollment of doctoral students was 410, which also substantially exceeded targets. The number of Ph.D’s awarded was 66, exceeding the target of 50.

Enrollment strategy includes limiting enrollment and allowing the level of student academic preparation and commitment to rise. The summary of issues related to enrollment, including new programs, expected improvement in retention rates, and the large pool of high school seniors for the next eight to ten years have resulted in enrollment targets that are higher, but not substantially higher. The enrollment target for 2005 (see KPI’s, Table 5) is 9,500 students (headcount). The target was developed through analysis of the following factors:

Analysis of Issues Related to Enrollment Projections

Extension of Enrollment Projections Forward

The projection tables developed at the time of the 1997 Periodic Review Report arrive at a total enrollment in the current year (2001) of 8,462, which has been surpassed by the fall 2001 enrollment of 8,862. The enrollment projections were based on an annual estimated an annual net gain of about 25 students. The actual net gain since 1997 has been approximately 180 students annually (from 7,962 to 8,862 divided by 5). It is
reasonable, therefore, to expect that 2005 enrollments will reach 9,500 based on routine increases in applications and yield of applications on acceptances.

**Improvements in the Retention Rate**

Some explanation of increased enrollment is due to continuing improvement of the retention rates. NJIT is experiencing a steady rise, which accounts for incremental increases to the enrollment annually. If targets of 50-55% graduation rates are achieved (along with the target of 90% freshman to sophomore retention rates), a significant proportion of the increases in enrollment accrue from improved retention alone.

**Pool of Applicants**

Population trends have been examined, and Figure 12 shows expected growth in the college population pool for the region until 2012. Based on pool growth, along with the increasingly stronger reputation of NJIT, the probability increases that NJIT will be able to attract large numbers of well-qualified applicants.

**New Programs, Modalities and New College**

Many new programs have been added that broaden the scope of disciplines that are taught at NJIT. Examples of those experiencing strong applicant interest are those programs in information technology and biomedical engineering. These new programs bring students to NJIT who may not have applied before. The addition of the College of Computing Sciences is sure to generate special focus for developing study and research opportunities that will draw students incrementally. In fact, it is an asset to the college and programs to have additional students in order to thrive and to acquire an appropriate diversity and depth of interests to develop an educationally rich array of programs.

In addition to new programs, new modalities of delivering programs, including distance education continue to attract increasing numbers of non-traditional students, and account
for expected growth in enrollment in the coming years.

**Student Diversity**

Students diversity continues to be robust. Male students continue to outnumber female students by a wide margin. Table 6 shows the distribution of students by ethnicity and gender for fall 2001 enrollments.

**Table 6: Enrollment by Ethnicity and Gender, Fall 2001**

<table>
<thead>
<tr>
<th></th>
<th>African American</th>
<th>Asian American</th>
<th>Hispanic American</th>
<th>Native American</th>
<th>White</th>
<th>Unspecified</th>
<th>Non US</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Year</td>
<td>Female</td>
<td>35</td>
<td>61</td>
<td>28</td>
<td>54</td>
<td>31</td>
<td>14</td>
<td>223</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>63</td>
<td>234</td>
<td>98</td>
<td>5</td>
<td>410</td>
<td>120</td>
<td>981</td>
</tr>
<tr>
<td>2nd Year</td>
<td>Female</td>
<td>28</td>
<td>58</td>
<td>24</td>
<td>1</td>
<td>59</td>
<td>40</td>
<td>222</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>92</td>
<td>187</td>
<td>82</td>
<td></td>
<td>299</td>
<td>112</td>
<td>829</td>
</tr>
<tr>
<td>3rd Year</td>
<td>Female</td>
<td>47</td>
<td>67</td>
<td>24</td>
<td>1</td>
<td>60</td>
<td>40</td>
<td>252</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>118</td>
<td>209</td>
<td>128</td>
<td></td>
<td>371</td>
<td>138</td>
<td>1026</td>
</tr>
<tr>
<td>4th Year</td>
<td>Female</td>
<td>49</td>
<td>103</td>
<td>43</td>
<td>1</td>
<td>83</td>
<td>40</td>
<td>340</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>126</td>
<td>235</td>
<td>121</td>
<td></td>
<td>462</td>
<td>119</td>
<td>1145</td>
</tr>
<tr>
<td>Others</td>
<td>Female</td>
<td>34</td>
<td>54</td>
<td>9</td>
<td></td>
<td>23</td>
<td>103</td>
<td>230</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>45</td>
<td>84</td>
<td>31</td>
<td></td>
<td>102</td>
<td>168</td>
<td>450</td>
</tr>
<tr>
<td>UG Total</td>
<td>Female</td>
<td>193</td>
<td>343</td>
<td>128</td>
<td>3</td>
<td>279</td>
<td>254</td>
<td>1267</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>444</td>
<td>949</td>
<td>460</td>
<td>8</td>
<td>1644</td>
<td>657</td>
<td>4431</td>
</tr>
<tr>
<td>Certificate</td>
<td>Female</td>
<td>8</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>19</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>16</td>
<td>16</td>
<td>4</td>
<td>1</td>
<td>49</td>
<td>54</td>
<td>21</td>
</tr>
<tr>
<td>Graduate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS</td>
<td>Female</td>
<td>44</td>
<td>101</td>
<td>27</td>
<td></td>
<td>85</td>
<td>86</td>
<td>612</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>85</td>
<td>220</td>
<td>73</td>
<td></td>
<td>408</td>
<td>189</td>
<td>1622</td>
</tr>
<tr>
<td>PHD</td>
<td>Female</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td></td>
<td>19</td>
<td>9</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>4</td>
<td>13</td>
<td>6</td>
<td></td>
<td>39</td>
<td>29</td>
<td>296</td>
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<tr>
<td>Others</td>
<td>Female</td>
<td>8</td>
<td>21</td>
<td>2</td>
<td></td>
<td>20</td>
<td>38</td>
<td>101</td>
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<tr>
<td></td>
<td>Male</td>
<td>17</td>
<td>25</td>
<td>11</td>
<td></td>
<td>57</td>
<td>47</td>
<td>195</td>
</tr>
<tr>
<td>Graduate Total</td>
<td>Female</td>
<td>55</td>
<td>128</td>
<td>31</td>
<td>0</td>
<td>124</td>
<td>133</td>
<td>827</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>106</td>
<td>258</td>
<td>90</td>
<td>2</td>
<td>504</td>
<td>265</td>
<td>2113</td>
</tr>
<tr>
<td>Grand Total</td>
<td>Female</td>
<td>256</td>
<td>478</td>
<td>161</td>
<td>4</td>
<td>422</td>
<td>403</td>
<td>2157</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>566</td>
<td>1223</td>
<td>554</td>
<td>11</td>
<td>2197</td>
<td>976</td>
<td>6705</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>822</td>
<td>1701</td>
<td>715</td>
<td>15</td>
<td>2619</td>
<td>1379</td>
<td>8862</td>
</tr>
</tbody>
</table>

**Changes in the Proportion of Men and Women**

While NJIT's overall enrollment has risen at a steady pace, it is important to note that female students represent the vast majority of this increase. Table 7 below shows that 918 more women attend NJIT than did eleven years ago (573 more at the undergraduate level and 345 more at the graduate level). Women now represent 24% of the entire student enrollment as compared to 16% in 1990. However, the percentage of women undergraduate students is 22.2%, which is lower than at other technologically oriented universities. This is an area of concern, and planning needs to include goals and strategies to increase both the number and percentage of women. Eleven-year comparison of enrollment levels by gender are shown in Table 7.
Table 7: Changes in Enrollment by Gender from 1990 to 2001

<table>
<thead>
<tr>
<th></th>
<th>Fall 1990</th>
<th>Percent of Total</th>
<th>Fall 2001</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>694</td>
<td>9</td>
<td>1267</td>
<td>14</td>
</tr>
<tr>
<td>Male</td>
<td>4263</td>
<td>56</td>
<td>4431</td>
<td>50</td>
</tr>
<tr>
<td>Sub-total</td>
<td>4957</td>
<td></td>
<td>5698</td>
<td></td>
</tr>
<tr>
<td>Graduate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>545</td>
<td>7</td>
<td>890</td>
<td>10</td>
</tr>
<tr>
<td>Male</td>
<td>2168</td>
<td>28</td>
<td>2274</td>
<td>26</td>
</tr>
<tr>
<td>Sub-total</td>
<td>2713</td>
<td></td>
<td>3164</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>7670</td>
<td>100</td>
<td>8862</td>
<td>100</td>
</tr>
</tbody>
</table>

In order to address the needs of the growing numbers of women students, the Murray Center for Women in Technology (originally named the Murray Women’s Center) was established in March 1996. In its first five years of operation, the Murray Center has been successful in its basic mission to provide a welcoming environment for women at NJIT. Focusing primarily on the needs of women undergraduates, the Center offers a rich array of mentoring, networking and special events programming. The Center also sponsors high school recruitment events and has developed a brochure targeting women high school students. While these efforts will continue, NJIT and the Center recognize that new initiatives are needed in order to change the cultural forces that still discourage young women from entering the fields of science, math, engineering and technology. The Murray Center and the Women's Committee are completing a study of progress made on women’s issues, including students and faculty, over the past ten years (see Appendix 15).

Language Minority Students

The English as a Second Language (ESL) undergraduate program at NJIT is offered by the Department of Humanities and Social Sciences. ESL courses require extensive writing and oral presentations, using such technological applications as PowerPoint. In addition to the basic ESL course sequence, the ESL program offers optional ESL sections of required courses in cultural history, technical writing, and literature, from freshman through senior year. These sections represent an intensive effort throughout the curriculum to help students continue to strengthen English skills as they master course content. There are six ESL courses offered to graduate students focused on different skills: two writing and four speaking (conversation and culture). A seventh course, ENG 599, helps Teaching Assistants deal with the diversity of the undergraduates at NJIT.

Student Life and Services

A new Dean of Students, Dr. Jack Gentul, was appointed in August 2001. A new position of Assistant Director for Student Development and Programming was created and filled in January 1999, to continue to increase the number and variety of evening and weekend activities and programs designed for students. Student services staff participated in a customer service program. Changes were developed by food services
providers in response to the student satisfaction survey and their own customer satisfaction survey. A parking deck, constructed in 1993, provided parking for 1,300 vehicles. Two additional floors were added to the deck, in fall 2000, increasing capacity to 1,750 vehicles.

Several student services offices have been relocated as a matter of convenience for students and to improve communication among students and staff. The Registrar, Bursar, Financial Aid offices, Personal Computer Lab, Computer Store, and Bookstore were relocated into a single facility, the Student Services Mall in December 1996, so that students could register, finalize financial aid, and pay their bills at the same location. Other related student services functions: Dean of Student Services, Dean of Freshman Studies, Educational Opportunity Program, Counseling Center, and Career Development Services moved to a renovated Campbell Hall in August 1999, so that students could easily move from one service to another seeking advice, counseling and support in solving problems and improving their overall academic performance.

In order to facilitate the goal of increasing out-of-state enrollment, and to meet in-state demand, NJIT constructed two new residence halls: Laurel Hall, housing 298 students, opened in fall 1997. The fifth residence hall (to be named), housing 284 students, opened in fall 2001, bringing the total number of students housed to approximately 1,500. Residence hall services and programming have been increased in order to meet the enlarged demand.

An important need stated in the 1997 Report was to upgrade the Hazell Center. Dining space was increased to meet greater numbers of residential students, and the Pub and recreation areas were renovated. An additional elevator was installed in compliance with the requirements of the ADA.

**Student Satisfaction**

The NJIT Office of Institutional Research initiated an annual student satisfaction survey beginning in the 1999-2000 academic year. Items were developed in collaboration with academic and student service providers across the campus, and the survey and procedures were designed to allow review of results and annual benchmarking of results of interventions against results. Results for 1999-2000 and 2000-01 are shown on Table 8.
Table 8: Mean Scores for Student Satisfaction (scale: 1=low to 5=high)

<table>
<thead>
<tr>
<th>Satisfaction (ordered by 2001)</th>
<th>2000 (n=308)</th>
<th>2001(n=428)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal security and safety on campus</td>
<td>3.87</td>
<td>3.82</td>
</tr>
<tr>
<td>Overall quality of own academic program</td>
<td>3.58</td>
<td>3.57</td>
</tr>
<tr>
<td>Overall quality of instruction</td>
<td>3.47</td>
<td>3.46</td>
</tr>
<tr>
<td>Availability of academic advisement</td>
<td>3.36</td>
<td>3.43</td>
</tr>
<tr>
<td>Library building, equipment and furniture</td>
<td>3.60</td>
<td>3.40</td>
</tr>
<tr>
<td>Fairness of rules/policies governing students</td>
<td>3.50</td>
<td>3.38</td>
</tr>
<tr>
<td>Quality of academic advisement</td>
<td>3.24</td>
<td>3.35</td>
</tr>
<tr>
<td>Opportunities to work in teams</td>
<td>3.33</td>
<td>3.32</td>
</tr>
<tr>
<td>Use of computing resources in course work</td>
<td>3.44</td>
<td>3.30</td>
</tr>
<tr>
<td>Assistance provided by library staff</td>
<td>3.59</td>
<td>3.28</td>
</tr>
<tr>
<td>Out-of-class availability of instructors</td>
<td>3.32</td>
<td>3.28</td>
</tr>
<tr>
<td>Web-based library resources</td>
<td>3.60</td>
<td>3.27</td>
</tr>
<tr>
<td>Availability of computer resources and services</td>
<td>3.53</td>
<td>3.27</td>
</tr>
<tr>
<td>Faculty enthusiasm for teaching</td>
<td>3.30</td>
<td>3.26</td>
</tr>
<tr>
<td>Opportunity to be involved in student orgs./events</td>
<td>3.30</td>
<td>3.17</td>
</tr>
<tr>
<td>Relevance of coursework to career</td>
<td>3.28</td>
<td>3.14</td>
</tr>
<tr>
<td>Billing and fee policies and procedures</td>
<td>3.18</td>
<td>3.12</td>
</tr>
<tr>
<td>General condition of buildings and grounds</td>
<td>3.01</td>
<td>3.08</td>
</tr>
<tr>
<td>Availability of tutoring and learning centers</td>
<td>3.50</td>
<td>3.07</td>
</tr>
<tr>
<td>Faculty concern for students as individuals</td>
<td>3.03</td>
<td></td>
</tr>
<tr>
<td>Availability of cultural and social events</td>
<td>3.14</td>
<td>2.98</td>
</tr>
<tr>
<td>Hardecopy publications in library</td>
<td>3.36</td>
<td>2.97</td>
</tr>
<tr>
<td>Staff concern for students as individuals</td>
<td>3.06</td>
<td>2.97</td>
</tr>
<tr>
<td>Support for computer software and hardware</td>
<td>2.91</td>
<td>2.89</td>
</tr>
<tr>
<td>Availability of parking</td>
<td>2.48</td>
<td>2.85</td>
</tr>
<tr>
<td>Quality of recreational facilities</td>
<td>2.86</td>
<td>2.78</td>
</tr>
<tr>
<td>Overall financial aid services</td>
<td>3.16</td>
<td>2.68</td>
</tr>
<tr>
<td>Opportunities to participate in research</td>
<td>3.03</td>
<td>2.64</td>
</tr>
<tr>
<td>NJIT's freshman PC distribution program</td>
<td>3.16</td>
<td>2.63</td>
</tr>
<tr>
<td>Quality of campus life</td>
<td>2.56</td>
<td>2.44</td>
</tr>
<tr>
<td>Community spirit on campus</td>
<td>2.51</td>
<td>2.41</td>
</tr>
<tr>
<td>Intercollegiate athletics program</td>
<td>2.94</td>
<td>2.29</td>
</tr>
<tr>
<td>Overall food services</td>
<td>2.14</td>
<td>2.24</td>
</tr>
<tr>
<td>Quality of residential life</td>
<td>2.83</td>
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<tr>
<td>Satisfaction item mean score</td>
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<td>3.03</td>
</tr>
<tr>
<td>Overall satisfaction</td>
<td>3.23</td>
<td>3.32</td>
</tr>
</tbody>
</table>

The student satisfaction survey revealed that there was opportunity for improvement in perceived "staff concern for students as individuals", and "food services." Consequently, all student services staff participated in a more comprehensive program designed to heighten sensitivity in responding effectively and warmly to student inquiries. Customer service training was provided for all personnel in student services, computing services, the library, and continuing education. As part of the plan to renovate and expand the Hazell Center, a food services consultant was retained to recommend a comprehensive food services program including all aspects of food availability on campus. The student satisfaction survey also indicated only moderate student satisfaction with the "quality of campus life", "community spirit on campus", and "athletics/recreation". In conjunction with the Middle States Association review, a comprehensive study of the quality of student life is currently underway to identify specific weaknesses, implement appropriate improvements, and create new programs. The Division of Academic and Student
Services is working toward streamlining the delivery of programs and services to students through focusing on the student experience

**Intercollegiate Athletics**

Intercollegiate athletics, physical education, and recreation are important components in the development of college students. Students learn leadership and team building skills as well as appreciation for personal health and fitness. NJIT currently competes in NCAA Division II providing 12 varsity teams. Additional women's teams will meet the need of the increasing number of women students. Intramural and recreational activities are offered through league competition as well as individual events. As the number of our full-time undergraduate students continues to grow, NJIT is committed to increasing the role that physical education and recreation play in enhancing the student experience. Expansion of athletic facilities weekend hours and offering new programs will meet increased demand for recreational activities. This also provides opportunities for students, faculty and staff to interact outside the classroom, thereby fostering a greater sense of campus community. The further development of athletic programs continues to be under review. The resource requirements of intercollegiate athletics must be critically examined in the contest of other University resource needs.

**D. THE ACADEMIC PROGRAM**

**NJIT’s Strategic Academic Priorities**

The strategic planning effort focused first on establishing strategic priorities for educational programs. Criteria for identification of the strategic directions for development included: (1) relationship to NJIT’s mission and strong technological, scientific orientation; (2) market demand and career opportunities for graduates; (3) attractiveness to a diverse student body (4) opportunities to build teaching, research and development partnerships with regional, national, and international entities.

The selection of programs meeting these criteria resulted in areas already cited in this document, and they include: information technology, bioengineering and applied life sciences, environmental studies and sustainability, advanced materials, and transportation. The implications relating to the selection of these areas are under consideration in the development of goals, objectives and strategies, and involve many aspects of university life, including program and curriculum development, program partnerships, student recruitment, faculty recruitment, and research initiatives, and other considerations.

**Distinctiveness of Programs**

The second important area of deliberation in considering the strategic plan for undergraduate educational programs included an overview and focus on distinctiveness of NJIT programs. NJIT degree programs have, as their goal, to prepare students for careers as ‘complete professionals,” with potential for leadership in their fields. The term “complete professional” is intended to describe a person who embodies honesty and integrity, embraces responsibility, is technically proficient, communicates effectively, comprehends the interdisciplinary nature of innovative thinking, can see the totality of an enterprise and the inter-relatedness of its goals, understands the competitive nature of the marketplace, is entrepreneurial, respects the environment, adapts to change with
flexibility, is a productive and cooperative team member, appreciates and respects diversity, and continues to learn throughout life.

The nature of the programs for which NJIT prepares students are characterized by rapid change. Each program is under continual review to ensure that changes are absorbed and included in the curriculum. Not only is course material routinely updated; the manner of teaching is also continually reviewed and revised to improve instruction and align instruction with changes in technology, new teaching and learning resources, and new information about pedagogical advances. Courses at NJIT have, for instance, become increasingly context-based, and they have been designed to include problem-based teaching and learning strategies. The integration of research into undergraduate education is encouraged. NJIT seeks to provide integrated learning experiences that provide a foretaste of the complexities of the workplace. The objective is to teach science, mathematics, architecture, management, engineering, and engineering technology in-context. The research results that NJIT has obtained in studying the effects of these approaches in the fundamentals of engineering course design, which is highly interactive, problem-based, and integrated, encourage work in this direction, and provides a model for instituting this approach.

New Academic Programs

A complete list of academic disciplines and programs can be found in Appendices 1 and 2 (undergraduate and graduate catalogs). Undergraduate programs represent 46.2% of all program offerings. Table 9 below shows the total number of disciplines, by school, by degree level:

<table>
<thead>
<tr>
<th>Discipline</th>
<th>NCE</th>
<th>NJSOA</th>
<th>CSLA</th>
<th>CCS</th>
<th>SOM</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor's</td>
<td>13</td>
<td>2</td>
<td>13</td>
<td>6</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>Certificate</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>4</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>Masters</td>
<td>19</td>
<td>2</td>
<td>16</td>
<td>3</td>
<td>2</td>
<td>42</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>11</td>
<td>5</td>
<td>2</td>
<td></td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
<td>4</td>
<td>37</td>
<td>7</td>
<td>7</td>
<td>115</td>
</tr>
</tbody>
</table>

1. Faculty

Faculty Appointments

NJIT’s 1992 Self-Study and Strategic Plan for Middle States (hereafter called the 1992 Report) stressed the need both to enlarge the faculty and to make faculty hiring “part of a careful plan of departmental and institutional development.” At that time, there were 336 full-time members of the instructional staff. The 1997 Periodic Review Report for Middle States (1997 Report) noted that “the size of the total faculty had grown only slightly” in the intervening years (to 354). Although the 1997 Report said that “the size, scope and quality of the faculty are sufficient to carry out the instructional mission at the present time,” the plan for expanded programmatic development, especially in PhD programs, would indicate the need for accelerated growth in faculty positions.
Table 10 shows the extent to which the objective of growing the faculty and instructional staff has been met.

Table 10: Full-time Instructional Faculty by Rank: 1991 – 2001

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dist.Prof.</td>
<td>13</td>
<td>12</td>
<td>9</td>
<td>12</td>
<td>16</td>
<td>19</td>
<td>20</td>
<td>21</td>
<td>23</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Prof.</td>
<td>90</td>
<td>92</td>
<td>99</td>
<td>97</td>
<td>108</td>
<td>110</td>
<td>109</td>
<td>113</td>
<td>113</td>
<td>113</td>
<td>118</td>
</tr>
<tr>
<td>Assoc.</td>
<td>97</td>
<td>99</td>
<td>98</td>
<td>95</td>
<td>103</td>
<td>102</td>
<td>111</td>
<td>107</td>
<td>110</td>
<td>109</td>
<td>99</td>
</tr>
<tr>
<td>Asst.</td>
<td>84</td>
<td>88</td>
<td>71</td>
<td>71</td>
<td>79</td>
<td>74</td>
<td>62</td>
<td>64</td>
<td>55</td>
<td>51</td>
<td>62</td>
</tr>
<tr>
<td>Total</td>
<td>284</td>
<td>291</td>
<td>277</td>
<td>275</td>
<td>306</td>
<td>305</td>
<td>302</td>
<td>305</td>
<td>301</td>
<td>297</td>
<td>303</td>
</tr>
<tr>
<td>Spec.Lect.</td>
<td>26</td>
<td>23</td>
<td>21</td>
<td>37</td>
<td>29</td>
<td>30</td>
<td>42</td>
<td>41</td>
<td>60</td>
<td>73</td>
<td>79</td>
</tr>
<tr>
<td>Other*</td>
<td>9</td>
<td>13</td>
<td>10</td>
<td>17</td>
<td>13</td>
<td>19</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>34</td>
<td>36</td>
</tr>
<tr>
<td>Grand Total</td>
<td>319</td>
<td>327</td>
<td>308</td>
<td>329</td>
<td>348</td>
<td>354</td>
<td>358</td>
<td>362</td>
<td>379</td>
<td>404</td>
<td>418</td>
</tr>
</tbody>
</table>

* Visiting Prof., Research Prof.

The decline in the number of new faculty brought into the university at the normal beginning rank for tenure-track positions deserves comment. The 1992 Report stressed the need for growth in that particular area: “Hiring policies and practices are critical to the university, particularly as they affect the faculty profile at the assistant professor level.” (p. 47). On the other hand, the 1997 Report (p. 152) specifically addressed the strategy of using non-tenure-track positions as a way of maintaining the flexibility needed in higher education, especially in a technological university determined to remain current.

The increase in full-time, non-tenure track instructors reflects a national trend in higher education. Over the course of the last two years, the NJIT administration and the faculty’s Professional Staff Association (PSA) have discussed the issue at the negotiating table. Accepting the premise that full-time, non-tenure track instructors (most of whom carry the title of Special Lecturer) allow flexibility and are used to supplement and complement faculty positions, the PSA and the university administration have agreed that such positions are not designed to compete with or supplant tenure track faculty lines. In the same spirit, the university’s Faculty Council has proposed a set of guidelines governing the employment of non-tenure track faculty. Those guidelines stress the professional nature of the Lecturer position, emphasize that the majority of university courses are to be taught by tenure-track faculty, and permit increased flexibility in those departments for which the potential tenure-track faculty may not be available. The administration has voiced its endorsement of these principles.

The result of this collegial approach to the use of non-tenure-track instructional staff has been to defuse an issue which has caused considerable tension and, in a few notable cases, conflict between administration and faculty in other universities.

Faculty Diversity

The 1992 Middle States Self Study Report recognized the continuing goal of a more diverse faculty and acknowledged that “NJIT’s record is disappointing, although
consistent with other technological universities.” That Report called for more aggressive recruitment strategies to attract a higher number of women and minority faculty.

An increase in the proportion of women faculty has been achieved, as is shown in Table 11. In 1991, 36 members of the full-time instructional staff were women, 11.3% of the total (up from 8.6% in 1981). By fall 2001, that number had increased to 71 and women now constitute 17% of the total. The largest increases, as with all other faculty, lie in the non-tenure track sector: from 6 to 25. Women represent 21.7% of that group. Of the new hires in fall 2001, 9 (39%) were women.

Table 11: Full-time Instructional Staff, 1991 - 2001, by Gender

<table>
<thead>
<tr>
<th></th>
<th>Fall 1991</th>
<th></th>
<th>Fall 2001</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female (%)</td>
<td>Male</td>
<td>Female (%)</td>
</tr>
<tr>
<td>Distinguished/Full Professor</td>
<td>95</td>
<td>8 (7.8)</td>
<td>126</td>
<td>16 (11.3)</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>88</td>
<td>9 (10.8)</td>
<td>86</td>
<td>13 (13.1)</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>71</td>
<td>13 (15.5)</td>
<td>45</td>
<td>17 (27.4)</td>
</tr>
<tr>
<td>Other</td>
<td>29</td>
<td>6 (17.1)</td>
<td>90</td>
<td>25 (21.7)</td>
</tr>
<tr>
<td>Total Tenure-track</td>
<td>254</td>
<td>30 (10.6)</td>
<td>303</td>
<td>46 (15.2)</td>
</tr>
<tr>
<td>Total All Full-time</td>
<td>283</td>
<td>36 (11.3)</td>
<td>418</td>
<td>71 (17.0)</td>
</tr>
</tbody>
</table>

Attempts to recruit Black and Hispanic faculty have met with limited success. Table 12 shows small increases in the upper faculty ranks, but the increase from 12 in 1991 to 16 in 2001 mirrors the overall increase in staff rather than an increase in the proportion of minorities. Black and Hispanic faculty are still underrepresented, at 5.3% of tenure track faculty, and 4.3% of the total full-time instructional faculty.

Table 12: Full-time Instructional Black and Hispanic Faculty

<table>
<thead>
<tr>
<th></th>
<th>Fall 1991</th>
<th></th>
<th>Fall 2001</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>B/H (%)</td>
<td>Total</td>
<td>B/H (%)</td>
</tr>
<tr>
<td>Distinguished/Full Professor</td>
<td>103</td>
<td>1 (1.0)</td>
<td>142</td>
<td>2 (1.4)</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>97</td>
<td>5 (5.2)</td>
<td>99</td>
<td>9 (9.1)</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>84</td>
<td>3 (3.4)</td>
<td>62</td>
<td>5 (8.1)</td>
</tr>
<tr>
<td>Other</td>
<td>35</td>
<td>3 (8.6)</td>
<td>115</td>
<td>2 (1.7)</td>
</tr>
<tr>
<td>Total Tenure-track</td>
<td>284</td>
<td>9 (3.1)</td>
<td>303</td>
<td>16 (5.3)</td>
</tr>
<tr>
<td>Total All Full-time</td>
<td>319</td>
<td>12 (3.8)</td>
<td>418</td>
<td>18 (4.3)</td>
</tr>
</tbody>
</table>

Continuous Improvement of the Quality of Instruction

The university faculty has recently adopted procedures designed to improve the system of faculty and course evaluation. The 1992 Middle States Self Study Report noted that each college at NJIT was using its own student evaluation of teaching form, and thus cross-college comparisons were difficult (p. 32). In AY 1999-2000 the Faculty Council worked with the Office of Institutional Research and Planning to create a university-wide procedure for student evaluation of course and instructor. The procedure included a common form, but with a sufficient number of blank question areas to allow a college or
department to add questions appropriate to its own uses (such as questions about currency of equipment in science labs or about the extent of teacher-student interaction in architecture studios). The form also allowed open-ended comments from students on subjects not covered on the multiple choice questions.

The procedure and form were approved by the faculty at large and were first implemented in the spring 2000 semester. The fall 2000 procedure yielded a total of 17,136 student evaluations for 1,094 courses. Summary results for all items are shown in Table 13.

<table>
<thead>
<tr>
<th>Item and Overall Mean Scores for Student Course Assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q.1 textbook 2.67</td>
</tr>
<tr>
<td>mean for Q1-4 2.86</td>
</tr>
<tr>
<td>Q.8 promptness and use of class time 3.29</td>
</tr>
<tr>
<td>Q.12 knowledge of course materials 3.49</td>
</tr>
<tr>
<td>Q.15 availability of equipment 2.74</td>
</tr>
</tbody>
</table>

Since the procedure devised in ’99-’00 was designed for face-to-face classes, The Faculty Council and the Office of Institutional Research and Planning have also collaborated to produce a procedure for evaluating Distance Learning courses on-line. This procedure was approved in AY ’00-’01 and will be administered in the Fall, 2001 term. In addition to helping evaluate faculty in these classes, the data will provide the opportunity for comparing student satisfaction in face-to-face classes with student satisfaction for DL classes.

Results for course assessments are available by faculty, program, school, and for the university overall and the reports are distributed to deans, chairs and faculty by the Office of Institutional Research and Planning. Results are routinely used for faculty
development, hiring and promotion, for teaching recognition and awards, and teaching assignments.

**Continuous Increase in Levels of Research and the Buyout Program**

Levels of funded research have continued to increase, as described in Chapter I. Consistent with university objectives of continuing this upward trend of research activity, an informal program of voluntary retirement buyouts was instituted for tenured faculty in 1999. At the completion of the program in 2001, a total of 25 tenured faculty had selected to take advantage of the buyout option. This created the opportunity to replace retiring faculty with research oriented faculty. Evidence to date is that this program has resulted in a robust and aggressive level of research development and a marked increase in submissions for funded research support, with much of it emanating from the ranks of newly hired faculty. Research initiatives are being developed in areas that are consistent with newly evolving curricular and research thrusts at the university.

**Recognition of Faculty for Excellence in Teaching**

The annual Van Houten Award for Teaching Excellence, chosen by university alumni, has been the primary form of recognition for teaching faculty since 1962. To broaden the levels of participation, the university created in 1988 a series of additional teaching awards covering a number of categories: graduate instruction, upper and lower level undergraduate instruction, and special awards for the outstanding special lecturer, adjunct instructor, and teaching assistant. Nominations for these university-wide awards, which are presented at a special convocation each fall, come from the various academic departments, many of which have their own forms of teacher recognition and reward.

In addition, Provost Van Buskirk instituted the Master Teacher designation, an award conferred annually by the Provost on a select number of tenured faculty who have demonstrated the highest level of teaching excellence over a sustained period of time at NJIT. In addition to receiving an award, Master Teachers are asked to participate in developing teaching excellence and they work with the provost to develop appropriate initiatives to achieve that end. The first class of Master Teachers was presented at the October 2000 Fall Awards Ceremony.

**Faculty Attitudes and Satisfaction**

The 1997 Periodic Review Report promised a survey “to determine the level of satisfaction of faculty with their positions.” A survey was developed and administered to all faculty and teaching staff in April 2001, resulting in 175 responses (approximately 26% response rate, including 29% response from full-time faculty). Major findings include:

- Faculty believe that university practices support the university mission. Faculty indicated that all aspects of the university mission are understood to be important to extremely important, and most of them felt this was especially true for integration of computing technology in instruction (89.8%), retention and graduation of students (86.2%), and encouragement of diversity in students and faculty (82.2%). Results are shown on Table 14.
Faculty feel generally positive about the university environment and all aspects of the university environment cited were rated from good to excellent by a large majority of faculty. They gave highest rankings to opportunities to serve the university community, opportunities for personal growth as an instructor, and professional research opportunities in own discipline. Results appear on Table 15.

Table 15: Faculty Assessment of University Environment

<table>
<thead>
<tr>
<th></th>
<th>good to excellent</th>
<th>fair to poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collegial environment of the university overall</td>
<td>73.1%</td>
<td>26.9%</td>
</tr>
<tr>
<td>Collegial environment in own school/college</td>
<td>76.9%</td>
<td>23.1%</td>
</tr>
<tr>
<td>Professional research opportunities in own discipline</td>
<td>73.3%</td>
<td>26.7%</td>
</tr>
<tr>
<td>Opportunities to express views regarding university practices and policies</td>
<td>60.6%</td>
<td>39.4%</td>
</tr>
<tr>
<td>Opportunities for personal growth as an instructor</td>
<td>79.7%</td>
<td>20.3%</td>
</tr>
<tr>
<td>Opportunities to serve the university community</td>
<td>84.2%</td>
<td>15.8%</td>
</tr>
<tr>
<td>Fairness of governance policies and practices</td>
<td>73.3%</td>
<td>26.7%</td>
</tr>
<tr>
<td>Fairness in hiring, promotion, and tenure procedures and practices</td>
<td>58.8%</td>
<td>41.2%</td>
</tr>
<tr>
<td>distinguished professors</td>
<td>71.4%</td>
<td></td>
</tr>
<tr>
<td>professors</td>
<td>80.0%</td>
<td></td>
</tr>
<tr>
<td>associate professors</td>
<td>41.5%</td>
<td></td>
</tr>
<tr>
<td>assistant professors</td>
<td>64.3%</td>
<td></td>
</tr>
<tr>
<td>instructors</td>
<td>48.3%</td>
<td></td>
</tr>
</tbody>
</table>

Faculty reported positive experience with the climate of the university, and the majority of faculty indicated that they agreed or agreed strongly that they were valued and supported at the university and within their departments. Responses tended to be more favorable as rank increased. Faculty indicated that they are largely satisfied with services, especially library services. They also were generally positive about the quality of workshops on instruction and the use of technology. They were positive about research development support, but this rating showed the most room for improvement. Detailed data tables and additional results of the survey can be found in the full report, which is included in Appendix 16.
Faculty Support and Development

The encouragement of faculty professional development is practiced at the university, college and department levels by the administrators through a variety of actions and activities. These include:

**Professional Activities**

In addition to the professional and scientific society activities of each faculty’s area of expertise, faculty are encouraged to participate in the activities of the appropriate professional organizations. Faculty serve as officers and work on committees in professional organizations, and many have been recognized for their professional contributions by these organizations. Twenty-nine engineering faculty have attained Fellow status in their respective professional societies. Faculty serve on many technical, scientific, architectural and other journal editorial boards. In addition, many faculty have received national, regional, and NJIT awards during the 1999-2000 academic year in recognition of their teaching, research and services to the profession. The President’s Annual Report, describing major projects, is found in Appendix 17. The NCE Annual Report, summarizing engineering-specific projects, appears in Appendix 18. A list of the most current faculty teaching, research, professional and service honors and awards is included in Appendix 19.

**Workshops**

A wide variety of workshops are held during the academic year, including special speakers on topics of interest to faculty, including workshops on pedagogy. In spring 2000, a two-day workshop on teaching/learning was conducted by the office of the Dean of NCE. Approximately 30 engineering faculty attended. A follow-up workshop was carried out in spring 2001, in which presentations were made by five participating faculty of the 2000 workshop on the implementation of some of the techniques covered in the workshop. Under the auspices of the Gateway project, NJIT has been hosting a regional teaching/learning workshop every spring since 1998.

In addition, workshops are conducted by NJIT in the use of technology and innovative instructional strategies. Several intensive Faculty Institutes, supported by NJIT’s I-TOWER grant and NJIT’s Teaching/Learning/Technology Center were held during 2000-2001 to provide faculty with skills and strategies for integrating technology into instruction. Evaluations indicated that faculty found the Institute to be very effective, practical and beneficial. Table 16 shows summary of results of 251 faculty assessment of aspects of the Institutes.
Table 16: Faculty Assessment of Aspects of the Faculty Institutes
(scale: 1=low to 4=high)

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Workshops (N=251)</strong></td>
<td></td>
</tr>
<tr>
<td>1 Printed material</td>
<td>3.21</td>
</tr>
<tr>
<td>2 Multimedia(computers,video)</td>
<td>3.51</td>
</tr>
<tr>
<td>3 On-line information</td>
<td>3.35</td>
</tr>
<tr>
<td>4 The extent to which workshop's objectives were clearly stated</td>
<td>3.47</td>
</tr>
<tr>
<td>5 The extent to which workshop's content is relevant to your needs</td>
<td>3.48</td>
</tr>
<tr>
<td>6 The extent to which the workshop met your expectations</td>
<td>3.30</td>
</tr>
<tr>
<td>7 The overall value of the workshop</td>
<td>3.43</td>
</tr>
<tr>
<td><strong>Instructors</strong></td>
<td></td>
</tr>
<tr>
<td>1 Ability to communicate</td>
<td>3.63</td>
</tr>
<tr>
<td>2 Ability to stimulate interest in the workshop content</td>
<td>3.51</td>
</tr>
<tr>
<td>3 Knowledge of the material</td>
<td>3.81</td>
</tr>
<tr>
<td>4 Use of technology in technology (computers, video)</td>
<td>3.68</td>
</tr>
<tr>
<td>5 Full use of workshop time</td>
<td>3.68</td>
</tr>
<tr>
<td>6 Ability to encourage active workshop participation</td>
<td>3.48</td>
</tr>
<tr>
<td>7 Ability to use appropriate teaching Methodology</td>
<td>3.50</td>
</tr>
<tr>
<td>8 Overall teaching ability of the instructor</td>
<td>3.60</td>
</tr>
<tr>
<td><strong>Facilities</strong></td>
<td></td>
</tr>
<tr>
<td>Comfortableness of the room (lighting temperature)</td>
<td>3.49</td>
</tr>
<tr>
<td>Availability of necessary equipment in the room</td>
<td>3.70</td>
</tr>
<tr>
<td>Technical Support</td>
<td>3.57</td>
</tr>
<tr>
<td><strong>Mean of Means</strong></td>
<td>3.52</td>
</tr>
</tbody>
</table>

A full roster of faculty development workshops for 2000-2001 appears in Appendix 20.

The Faculty’s Role in Promotion and Tenure Decisions

Promotion and tenure procedures are described in the Faculty Handbook, and each year the Provost elaborates on the criteria in a memorandum to all faculty. The promotion and tenure process relies on a review of each candidate by his/her peers, consisting of distinguished and full professors in the candidate’s own department, and then by the University Promotion and Tenure Committee consisting of professors from all colleges. Their recommendations are sent to the provost and president for review. The President recommends candidates to the Board of Trustees, which makes the final determination for each individual candidate. In addition to candidates for promotion and tenure, each full-time faculty member is reviewed every year as part of merit review, a process delineated in the contract negotiated between the university and the bargaining unit. The faculty role is summarized in Provost Van Buskirk’s memorandum of September 1, 2000 (Appendix 21).

Faculty and Research

NJIT has made a transition from a teaching college with no appreciable research twenty-five years ago to a national research university, with almost a five-fold increase in research and development expenditures over the last ten years. To facilitate that transition, a number of policies were instituted to encourage faculty members to re-direct
their professional efforts. These policies, in concert with new faculty recruitment and establishment of promotion and tenure guidelines based on a research university model have been effective in transforming the character of the institution. Policies that provide strong incentives to perform funded research remain in place and accrue to the benefit of newly hired and life-long faculty alike.

NJIT provides a generous match to all proposals for external funding. Each faculty member has a one-quarter teaching load reduction granted for demonstration of research activity. In addition, the university typically matches one course of load relief for every course supported by academic year funded release. The university grants a full tuition waiver for each graduate student stipend that is fully supported with benefits and indirect cost recovery. The indirect cost recovery on grants serves as the source for institutional matching. Most proposals carry a substantial institutional match in addition to those described above, often to the limit of the full indirect cost recovery. In addition to the substantial match commitment at the proposal stage, faculty members also receive an annual, pro-rated distribution of discretionary funds from the year-end balance of indirect cost recovery. “Start-up” packages are often provided to new faculty.

NJIT has a long-standing program of investment to ramp up research efforts of new faculty. The Separately Budgeted Research program is an annual allocation of roughly $600,000 that is distributed to new, tenure-track faculty to help launch their independent research program. Awards are capped at $20,000 and can be renewed for up to the first three years of the assistant professor’s employment at NJIT. The typical award supports summer activities, and equipment necessary to develop proof-of-concept data for the faculty member’s first submissions for external support.

For FY2001, approximately 38% of the NJIT faculty are listed as principal Investigators (PI) on externally funded research grants and contracts. The percentage goes from 21% in the new College of Computing Sciences to 44% in Newark College of Engineering. The average award, as budgeted for one year, is $316,400 for each principal investigator and $120,300 if averaged over the faculty group. The dollars per principal investigator actually compares quite favorably to data reported in the most recent issue of U.S. News and World Report for the top 50 graduate schools of engineering. However, the low percentage of faculty involved with funded research needs to increase to bring the dollars per faculty member, rather than dollars per principle investigator to the levels of a top-ranked research university. The total for Newark College of Engineering for FY2001 is about $17 million and that would need to rise to about $25 million to be comparable to about 10 of the 50 top-ranked universities.

Throughout the on-going process of faculty peer review, beginning with the initial search, through the tenure review period, and later in evaluating faculty for further promotion and for merit increases, teaching effectiveness is a necessary criterion. Although great emphasis is placed on research and scholarship in the promotion and tenure process, teaching effectiveness is considered by all faculty committees and by the upper administration to be a sine qua non in the faculty reward system.

Faculty Handbook Update and Revision

The Faculty Handbook sections on promotion and tenure were reviewed and revised in view of current policies in 2001-2002: the revised Handbook can now be found on the NJIT website. The Handbook appears as Appendix 22.
2. Undergraduate Educational Programs and Curricula

Eleven new programs have been added since the 1997 periodic review report. The new programs respond to New Jersey’s 1996 Plan for Higher Education that calls for “partnerships, resource sharing, and coordination in program development and delivery, recognizing that complementary programs and services serve students effectively and economically.” They also stress the need for high quality undergraduate education that prepares student’s broadly for life’s challenges. The Plan also stresses that “the development of critical thinking and problem solving skills, as well as sophistication in the use of technology is essential.” Furthermore, the new programs aim to meet workforce needs effectively, and seek the advice of employers to assist faculty in designing programs and curricula that are responsive to employers’ specific needs. New programs initiated since 1997 include:

- B.S. Architecture (the B.Arch has existed since the School of Architecture opened)
- B.S. and B.A. Biology w/ Rutgers
- B.S. and B.A. Professional and Technical Communication
- B.S. Environmental Science w/Rutgers
- B.S. Geoscience Engineering w/Rutgers
- B.A. History w/ Rutgers
- B.S. Environmental Engineering
- B.S. Biomedical Engineering
- B.S. Information Technology
- B.S. Information Systems
- B.S. Human Computer Interaction w/Rutgers

The review process has also lead to recommendations for termination of programs such as Power Engineering, Applied Science, and Interdisciplinary Studies and the Degree of Engineer. The Graduate Certificate programs are reviewed annually and several are recommended for retirement each year for replacement by more timely areas of study.

Updating of the General University Requirement (GUR)

A fundamental principle guiding development of the general university requirement (GUR) for all NJIT students was the formulation of a superior core curriculum encompassing most of the prerequisites for success in the major undergraduate disciplines. In a larger sense, however, the GUR is intended to provide an educational foundation for undergraduates that fulfills the implicit intellectual and social contract that NJIT has with its students and its local, national and world communities.

A committee comprised of university faculty, department chairs, deans and the provost was formed at the beginning of the 2000-2001 academic year to study the current general university requirement in order to assess the extent to which the current content and organization of the general university requirements sufficiently support the academic programs given the changes and the additions that have recently taken place. The committee received its charge from the President and is chaired by the Dean of the New Jersey School of Architecture. Research conducted by the Office of Institutional Research...
and Planning on “barrier courses” helped to inform members of the committee with regard to the need for redesign of content, sequence, and delivery of GUR offerings. In this study, 37 GUR courses and instructors were tracked for 12 semesters to establish pass-fail grading patterns. As Figure 13 illustrates, the study demonstrates that pass rates for GUR courses needed to be improved. The program specific entry level courses (diamond marker) shows that the most courses have pass rates of from 75 to 95 percent, with most courses showing a 76-80 percent and 86-90 percent pass rates for students. For GUR courses (square marker), a large number of courses have pass rates in the 61 to 75 percent range, leaving room for improvement.

**Figure 13: Pass Rates for GUR and Program Specific Required, Entry Level Course**

The committee met regularly throughout the year, researched and studied many models of undergraduate requirement programs, considered various options to improve the GUR. A new GUR structure, including new content has been devised and will be presented to the university community in spring 2002 for discussion and approval.

**Meeting the Needs of Students in the Market Place**

Measures of the appropriateness, applicability, and success of the NJIT undergraduate program include results obtained in regularly conducted surveys among students, graduates, alumni and employers regarding the performance and success of graduates in their careers. NJIT regularly surveys enrolling students, to monitor student goals, and graduating students, to monitor student success in meeting these goals. Entering students at NJIT generally report high career aspirations. The most recent Graduating Student Survey (May 2000) provides a summary of how well graduates feel they have met their goals at NJIT (Shown on Table 17). All ratings are positive (greater than 3) and generally are high (above 3.5) to very high (4 or above).
Table 17: Mean Ratings by Graduates on Achievement of Goals
(Scale: 5=high, 1=low)

<table>
<thead>
<tr>
<th>Degree to Which Grads Achieved Goals</th>
<th>Obtained a degree</th>
<th>Prepare for a career</th>
<th>Attain skills that will be useful on the job</th>
<th>Improve ability to make more money</th>
<th>Improve personal professional status</th>
<th>Meet academic requirements for graduate school</th>
<th>Simply learn</th>
<th>Understand and appreciate science and technology</th>
<th>Discover vocational interest</th>
<th>Improve self image</th>
<th>Learn how to participate effectively as a citizen</th>
<th>Increase awareness of different ways of life</th>
</tr>
</thead>
<tbody>
<tr>
<td>sample=254</td>
<td>4.22</td>
<td>3.45</td>
<td>3.62</td>
<td>3.54</td>
<td>3.78</td>
<td>3.83</td>
<td>3.74</td>
<td>3.72</td>
<td>3.17</td>
<td>3.60</td>
<td>3.06</td>
<td>3.41</td>
</tr>
</tbody>
</table>

In addition, alumni are regularly surveyed for information on their positions and salaries to assess the value added to the student’s career of their educational experience at NJIT. Figure 18 shows the level of employment, and the percent agreement, on the part of alumni, that the earned degree improved job status and salary level. In both instances, the NJIT education made a meaningful positive difference for the largest proportion of respondents.

Table 18: Alumni Responses to Employment Questions by School

<table>
<thead>
<tr>
<th>Percent</th>
<th>SoA</th>
<th>NCE</th>
<th>SoM</th>
<th>CSLA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed</td>
<td>93.02</td>
<td>95.10</td>
<td>94.52</td>
<td>93.44</td>
</tr>
<tr>
<td>Degree improved job status</td>
<td>76.74</td>
<td>74.50</td>
<td>62.86</td>
<td>76.27</td>
</tr>
<tr>
<td>Degree improved salary level</td>
<td>57.14</td>
<td>72.59</td>
<td>81.69</td>
<td>75.86</td>
</tr>
</tbody>
</table>

Meeting Industry Needs

Industrial advisory committees exist at the department, program, college and university levels. The advisory committees associated with programs at NJIT provide regular forums for reviews of programs and needed refinements and revisions to ensure that curriculum is capturing changing demands for new and different skills and knowledge. NJIT conducts periodic surveys of employers on topics such as the skills, knowledge, attitudes and behaviors that employers value in employees and also to assess the performance of NJIT students and graduates on the job. This is very useful to continually improve the curricula, programs, and determine whether the training of NJIT students for the job market meet the needs of industry and prepare the students for successful careers. Such surveys provide a basis for the comparison of university curricular and student development goals with the needs of business and will assist in refining and updating curricular objectives to meet the current needs of industry. NJIT students and graduates
were highly ranked by their industry employers. Figure 14 shows the rankings of supervisors of NJIT graduates on the job for specific and important skills and abilities:

**Figure 14 : Supervisor Ratings of NJIT Graduates On-the-Job**

A comparison of employers’ ratings of importance, and rating of NJIT students on performance is shown in Figure 15. Employers rate NJIT graduates high on the skills, knowledge and qualities they most value. Program objectives appear to be substantially consistent with the needs of the marketplace and NJIT students excel by reaching intended outcomes.
The self-report of alumni converges with opinions of employers that oral and written communication skills leave room for improvement. These results suggest that curricula could be reviewed for increased opportunities to improve skills in written and oral communication. Results vary by school and the magnitude of implications need to be reviewed by each school.

3. Graduate Studies and Research

New Programs and Research Areas

The number of graduate programs offered by NJIT has increased steadily from the time of the last Middle States visit. The new programs reflect faculty interests, national and state research directions, industry needs, and institutional planning. The number of available Master’s programs has increased to 44 and the number of Doctoral programs to 18. Degree of Engineering programs have been phased out because of lack of interest by students and faculty.

The Collaborative Doctorate Program, an option for part-time Ph.D. students, was developed to attract students from the industrial sector by creating a doctoral process attractive to four stakeholders: employers, students, faculty, and the university at-large. The program allows students to take advantage of research interests that fit employer interests and allow residency to be satisfied at the employer’s site rather than formally at the university. The flexibility of course delivery by NJIT and the capabilities of electronic communication are used wherever possible to handle course requirements. The program retains all the rigorous quality control measures and standards associated
with traditional scholarly endeavor and doctoral study. It is not a separate degree program but is a method for students to pursue the doctorate in the regularly titled doctoral degree programs at NJIT. New graduate degree programs introduced since 1997 include:

- M.B.A. Management of Technology
- M.S.N. Nursing – Nursing Informatics w/UMDNJ
- M.S. Telecommunications
- M.S. Applied Statistics
- M.S. Computational Biology w/Rutgers-Nwk
- M.S. Internet Engineering
- M.P.H. w/Rutgers
- M.S., Ph.D. Biology
- M.S., Ph.D. Materials Science and Engineering
- Ph.D. Biomedical Informatics w/UMDNJ
- Ph.D. Biomedical Engineering w/UMDNJ
- Ph.D. Chemistry
- Ph.D. Computer Engineering
- Ph.D. Urban Systems w/Rutgers and UMDNJ

Upgrade in the Carnegie Classification

NJIT was designated a Carnegie Doctoral II institution in 1994. The criteria for Doctoral I by the year 2000 were met. However, the Carnegie classification system was revised in 1999. The Doctoral I, Doctoral II, Research I and Research II categories were replaced by a combined Doctoral I/Research I category called Extensive University status and a combined Doctoral II/Research II category called Intensive University status. The new categories eliminated the federal funding guidelines but retained most features of the doctoral graduate count criteria. NJIT was, therefore, placed in the Doctoral Intensive category that requires an average of 20 or more Ph.D.’s per year. The university faculty supervised over 50 PhD completions for the first time in 1999-2000 and appear to be continuing at that level or higher for the current year.

Graduate Student Diversity

The location, mission, and reputation of New Jersey Institute of Technology as a public research university within the New York/New Jersey metropolitan area provides both opportunities and issues for diversity in its student populations. The 2001-02 graduate enrollment figures (3164 total) show 9.8% identified as Black or Hispanic, 12.9% as Asian, and 40% international. (As many as 14.8% of students do not report ethnicity, and the proportion of students who chose not to report ethnicity rises each year, similar to national trends.) The international student population at NJIT comes from 124 different countries or political entities. The ethnic diversity of the area is well known, as is the identity of this area of New Jersey as a Gateway Region. The variety and quality of NJIT’s programs, their applications orientation, the opportunities for work and practical training in technological fields, particularly in the most popular fields of information technology, the ethnic diversity of the region, and NJIT’s excellent reputation in many countries, are all powerful attractions for qualified international students.

The figures from the 1999 NRC/NSF Summary Report on Doctorate Recipients from United States universities show that the national percentage of minority PhD recipients in
engineering was 3.4% for the Black cohort and 2.9% for the Hispanic cohort. For the physical sciences, the percentages were 2.6% for Black and 2.7% for Hispanic. It is interesting to compare these figures with data from 1979 and 1989 where, for engineering, the percentages were 1.3% and 1.2% in 1979 and 1.3% and 1.8% in 1989 for Black and Hispanic, respectively. There has been a significant percentile increase only over the past 10 years and if the data is looked at more closely, that increase is seen to have occurred largely over the last 5 years. Since NJIT percentages of minority doctoral students seem to compare with national data for graduates from 5-10 years ago, NJIT appears to be following national trends but with about a 5 year time lag.

It is noted that over the last decade and particularly over the past 5 years, NJIT has become much more active in programs targeted toward recruitment of minority students into graduate programs and eventually into doctoral programs. The following programs are now in place whose primary mission or a primary focus is to increase minority population percentages:

- McNair Post-Baccalaureate Achievement Program
- NSF Alliances for Graduate Education and the Professorate (MAGNET-SEM partnership with the City University Graduate Center)
- GEM Program (National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc.)
- Minority Academic Career Program of the State of New Jersey
- NJIT Presidential Fellow and NJIT Provost Fellow Programs
- Undergraduate Research Experience Program
- Project 1000 Consortium

This grouping of programs recognizes the efforts needed to build a pipeline and interest in graduate education from the baccalaureate years. Indeed, NJIT’s rich array of pre-college programs has built a pipeline that starts in grade school.

Research and Participation in Economic Development

President Fenster has established the framework for expanding the research opportunities at NJIT in non-traditional venues as well as traditional scenarios. An environment has been created in which the structure responsible for nurturing university activities is charged with seeking relationships with industry. University research has become a resource and a support for both industrial research and development outsourcing and for cooperative research and development and human resource development.

NJIT has reorganized its research and development management to facilitate growth of both traditional, grant-funded, curiosity-driven research as well as more applied, programmatic and mission focused research. The latter serves both government and industrial customers and supports the public service and economic development mission elements of the university. The Office of Research and Technology provides the integration point that spans these two cultures. Underlying elements include the Office of Sponsored Programs, the Office of Government Affairs, the Office of Intellectual Property, line staff dedicated to project management and program administration, and an array of centers that span the spectrum from academic research centers to free-standing, industry sponsored research organizations. The organization features new and additional supports to faculty in supporting funding initiatives, and the Office of Sponsored Programs plans to expand these services.
New Research Development Strategies in Place

The university has restructured the administration of research and development programs to provide comprehensive and integrated support for individual and team researchers from grant opportunity identification through award of a successful proposal. The Vice President for Research and Development has overall responsibility for the Office of Sponsored Programs (OSP), Office of Government Affairs (OGA), and Office of Intellectual Property (OIP). The OSP has primary responsibility for all pre-award services and position requirements were recently upgraded at all skill levels to promote better interaction between faculty principle investigators and administrative functions. The OIP is adding professional staff to accommodate the increase in patent filings as well as the increase in legal support required as faculty engage more broadly in industrially supported research. The OGA has been integrated into the university research management structure since its principal focus of activity is on state and federal efforts associated with supporting the research enterprise.

The university has created standards for institutional research matching funds aimed at encouraging and rewarding active researchers, while maintaining uniformity that offers a fair chance to all proposers to garner matching funds. Match support is proportionate to indirect cost recovery, and additional discretionary funds are provided to those researchers contributing most to the pool of recovered funds. Almost all of the institution’s indirect cost recovery is re-invested in direct expenditures for academic research.

The university is using two approaches to create new funding opportunities for faculty research – identifying new sources of support and creating teams to pursue new types of funding opportunity from existing sources. The two approaches are not mutually exclusive. The university recently was admitted as a member of the Federal Aviation Administration’s Center of Excellence program with an opportunity to compete against a select group of 15 other schools for over $10M/yr in R&D funding. The school has a disproportionately low level of Department of Defense support relative to other research universities and has added staff to develop stronger R&D relations with that sector – especially the operations based in New Jersey: Picatinny Arsenal, Ft. Monmouth, Ft. Dix Battlefield Training Labs, and US Navy Lakehurst. The university has also demonstrated the ability to manage and perform large, inter-disciplinary engineering development projects for industry and government. These offer faculty and students an exposure to state of the technology problems and provide sustaining funding for curiosity driven research.

The Collaborative Doctorate program has produced hundreds of contacts and at least 20 new graduate students whose research will be based on the mutual interests of their employers and NJIT. The rapid growth of Graduate Certificate programs and off-campus and distance learning has brought many new students to NJIT from the industrial sector.

NJIT has made a deliberate effort to more formally interact with industry in modalities other than the traditional exchange between faculty-graduate student team and industrial laboratory. An evidence of this is the school’s hosting of a variety of industry-focused organizations that bring full-time professional and technical staff into collaboration with university resources. Examples include the Polymer Processing Institute, Inc., the NJ
Manufacturing Extension Program, Inc., and newly created NJ Energy Research Consortium, a Sustainable New Jersey Consortium, and the NJ Transportation and Planning Authority. These activities account for roughly $15 million in funded activity and bring problems of an applied focus, pilot and production scale equipment and experienced professionals into direct contact with the academic enterprise.

**Improved Quality of the Graduate Student Population**

Student preparation is regularly evaluated by the Graduate Council. The following quantitative measures are used to evaluate applicants: Graduate Record Examinations or Graduate Management Admission Test, Test of English as a Foreign Language, undergraduate and graduate grade point averages. Higher standards have been set for every one of these measures across graduate programs. Individual programs are permitted to set higher level criteria for these than the established university minimum levels set by Graduate Council action.

**4. Continuing and Distance Education and Instructional Technology**

Through distance education modalities, NJIT now offers five complete undergraduate and graduate degree programs, nine graduate certificates, and 150 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 Distance Learning courses consists 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 multimedia methodologies coupled with CD-ROMS, computerized conference such as streaming audio/video, interactive transmission, and/or videotapes. Over the past five years, NJIT’s Distance Learning enrollments have increased over 100% with an inventory of over 150 courses produced within nineteen academic disciplines. During the past academic year, NJIT’s Distance Learning course enrollments exceeded 4200. Over 65 NJIT faculty have originated courseware for NJIT’s Distance Learning.

**The Learning Outcomes Challenge**

As distance learning and the use of instructional technology increases, what remains to be determined are questions dealing with best practices, as determined by learning outcomes for such face-to-face classes versus those offered via distance learning. Complicating this matter is the fact that what is becoming the norm in face-to-face classes cannot be said to be identical to what occurs in the distance learning experience. In particular, what faculty have derived from the distance learning experience and are now using in their face-to-face applications concerns using the unique capabilities of the web to make learning environments more engaging (e.g., relevant websites and graphic/video materials), and to involve students in threaded, asynchronous electronic discussions that, in fact, typically occur outside the class meeting time.

The challenge is to continue to determine which unique capabilities of the web make learning more effective; and how continued improvements of the educational process can be made, whether in traditional face-to-face classes, technology-infused face-to-face classes or technology-dependent distance learning offerings. Research is ongoing within NJIT’s regular outcomes assessment program and is a component of funded research projects in these areas.
Impact on Faculty Intellectual Property Rights

NJIT’s computing-intensive focus also impacts another aspect of the teaching/learning equation: intellectual property. Initially, there was some faculty apprehension about disintermediation; that is, learning occurring directly between online content and students without benefit of their mentoring and assistance. This fear has all but ceased. Today, it is not so much about the “clicks” causing faculty to have their jobs threatened. But rather about a “non-click” concern for protection of their reputations and ability to generate additional revenue from the fruits of their intellectual property. It would appear that these fears are being allayed at NJIT in a less contentious manner than elsewhere. One reason for this may be that the NJIT faculty has been able to witness first-hand over the years just how the cadre of distance learning pioneers have fared. What they have seen is that, on the one hand, no distance learning professor – even the most distinguished at NJIT - has personally struck it rich from his/her online course; on the other hand, that the university has neither sought to nor reaped profits by taking advantage of its faculty who excel at online creation.

These two realities have helped both sides in faculty and administration relations to realize that whatever differences exist between face-to-face and distance learning course delivery, the existing set of contractual terms, rules and policies that work in face-to-face settings can suffice to determine such issues as appropriate distance learning class size and compensation levels for content preparation and teaching, as long as copyright ownership is unbundled in a way which leaves room for the faculty member to gain benefits from derivations of the creation of an online course.

Life Long Learning Programs

The Graduate Certificate program had 224 enrollments in fall 2001 (850 in the full 2000-2001 academic year) with the most popular certificates being those that are offered via distance learning. The 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 or through distance learning. The extension program began in 1974 when courses in computer and information science were offered at Drew University. During AY00, NJIT offered courses at 14 extension sites throughout New Jersey. For fifty years, NJIT has been designing and conducting customized non-credit courses that meet the needs of technology-based organizations 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. From FY96 to the present, NJIT’s Customized Corporate Training program has executed training contracts with over 280 companies, positively impacting over several thousand individuals per year. The Professional Development and License Review Program offers non-credit short courses, certificates, and license reviews. In AY00-01, over 145 non-credit courses enrolling over 4000 students were conducted. The non-credit WebMaster 2001 Program (launched in Fall 1996) escalated in demand,
particularly in the “to-the-desktop” version. Additional courses were added to the program, bringing the total number of courses offered from three to seventeen.

Throughout the years, NJIT has used internal resources and has received external support totaling nearly $9,000,000 to help distance learning reach new levels in rapid order. Examples of externally-funded projects include:

- WebCenter for Learning Networks Effectiveness (01-02), funded by Alfred P. Sloan Foundation ($370,000)
- H1-B Visa IT Training Program (01-03), funded by US Department of Labor ($2,770,000)
- Form-Technology Opportunities for the Workforce, Education and Research (00-05), funded by NJ Higher Education Commission ($2,500,000)
- NJ Center for Multimedia Research (96-01), Funded by NJ Science and Technology Commission ($1,043,000)
- From Virtual Classroom to Virtual University (97-00), funded by Alfred P. Sloan Foundation ($450,000)
- Video + Virtual Classroom (93-96), funded by Alfred P. Sloan Foundation ($718,000)
- Tools for Enhancement and Evaluation of Virtual Classroom (85-89), Funded by Annenberg/Corporation for Public Broadcasting, NJ, and IBM ($815,000)

In addition, in response to the agile learner’s need for lifelong learning that is practical and specific, NJIT has begun to consider “atomizing” standard 3-credit online academic courses by refashioning their content into a number of smaller blocks of online non-credit course(s). The adult would then have the choice to exit after completing the exact number of modules needed for his/her purpose or to take the requisite number of modules to permit NJIT to reconstitute the online experience back into its original form as an academic course. Success with this initiative implies a movement from a “clicks and mortar” university to a “bits, clicks and mortar” enterprise.

**Technology in Instruction**

The 1997 Periodic Review identified three general infrastructure modifications necessary to meet the challenges of a changing landscape of information technology and its uses: (1) enhanced network communication, (2) a capable desktop with appropriate tool suite, and (3) training and facilitation improvements. In December 1997, in response to the Periodic Review, President Fenster formed the University Information Services and Technology Planning Task Force and charged the task force with evaluating the university’s current technology infrastructure and making recommendations for its improvement, and to establish a formal, on-going, and university wide planning process for technology support of teaching, learning, research, and administrative support. Among the benefits of the Information Services and Technology (IST) Plan was significant progress toward addressing infrastructure needs described in the 1997 Periodic Review. The plan’s influence was seen in four major areas: (1) goal statements, (2) technology infrastructure requirements, (3) reorganization, and (4) funding resources.
Goal Statements - NJIT established a set of Information Services and Technology (IST) Goal statements which guide long term planning.

Fundamental Technology Infrastructure Requirements - The IST Plan defined a six-component set of technology infrastructure requirements, necessary to support all teaching, learning, research, and administrative support, whether university-wide or departmental specific. Maintenance of this technology infrastructure has become a significant priority in annual funding. The components are shown in Figure 16, and the major initiatives in meeting goals and objectives of both the IST Plan and the 1997 Periodic Review are also shown.

The Basic Support Component aims to maximize the benefits of connectivity and technology while minimizing the frustrations typically experienced by users of technology. A customer-focused user services organization is being built within the Academic Computing Department. As described in the Periodic Review, this organization aims to be the single point of contact for all problem reporting, information services, support, training, and documentation. A Computing Help Desk has been established to coordinate all technology related support. Staff positions have been reallocated to help support this function. Web-based e-Learning software has been licensed and is available to all members of the university community. It covers a wide range of technology-related topics, including the Microsoft Office suite and basic web development. A Teaching Learning, and Technology (TLT) faculty development program has been established to help faculty deal with new technologies and integrate them into the curriculum. This is a joint effort on behalf of Computing Services, Instructional Technology and Media Services, and the Library. The TLT program is supported with a new Instructional Designer position and significant numbers of students who serve as ‘reverse-mentors’, working with faculty in NJIT’s STARS program (Student Technology Advisors and Resource Services).

The Pipeline and Network Connectivity Component is specifically designed to enhance inter-institutional and intra-institutional connectivity by providing increased bandwidth and campus connectivity toward meeting the goal of universal access to services, both on and off-campus. All campus locations have been re-wired to support high-speed network
connectivity, eliminating the need for terminal servers. Wireless connectivity has been brought to most academic buildings and will be expanded to meet the needs of portable computer users as that critical mass grows. Ten-year old video production and network routing facilities have been upgraded. The campus modem pool was upgraded to support 5600 KB and ISDN connections. Internet capabilities have grown from 3 Mb to 27 Mb. A Virtual Private Network (VPN) was installed allowing off-campus members of the NJIT community to use a local ISP for access to proprietary campus information services (e.g. library databases). Off-campus connectivity resources will grow significantly during the 2001-2002 academic year when NJ EdgE.Net, New Jersey’s higher education network, of which NJIT is a member, becomes fully operational.

A full discussion of all components of the plan can be reviewed in the Information Systems Services and Technology Plan found in Appendix 23.

**Technology Funding Resources**

Beginning in FY 1999, the university annually reallocated $1 million from the current operating budget and established a new technology infrastructure fee that is assessed to students. Combined, this provides $1.5 million annually to support technology infrastructure and deal with problems of obsolescence. State funded support with the Technology Infrastructure Fund ($2.8 million in 1998) and the Equipment Leasing Fund ($6.4 million in 1995, $6.6 million in 2001) continues to provide funding for major capital improvements centrally and at the departmental level. Significant additions to equipment have also been made through research grants.

**Student and Faculty Satisfaction with Computing Resources**

Students and faculty were surveyed specifically on computing resources, and the student satisfaction survey routinely queries student opinion regarding computing supports. Results of these surveys have converged to indicate the following issues need to be addressed:

a. It is a running theme in student comments on both the 2000 and 2001 student satisfaction surveys that students expect and desire increases in the use of computing and technology in course work.
b. The 2000 Student Satisfaction Survey showed students placed high importance and satisfaction on the availability of computing resources on campus.
c. Students place high importance and low satisfaction on the support available for computer hardware and software.
d. Students would like the quality of computers in the freshman computer distribution program to continue to be upgraded. Faculty indicate that they would like the free computer distribution program extended to include transfer students.
e. The computing services organization needs to do a better job of explaining services that are available to faculty and students and how to take advantage of them. Often people find out by word of mouth or from friends and acquaintances.
f. To meet student need, there needs to be a greater amount of peripheral computer equipment throughout the campus.
These results occur, in part, as an indication of the high level of expectation among students at a campus where large sums have been expended on technology and which is perennially rated among the 10 “most wired” universities in country.

E. THE LIBRARY, TECHNOLOGY AND LEARNING RESOURCES

University Library

In 1998, a new library was added as part of new facilities for the School of Architecture, almost doubling the size of the Architecture Library to 6,000 square feet with 150 seats. This is the second new NJIT library facility in ten years. Current building plans include reprogramming of the use of space in current structures to increase the size of the Van Houten library, including areas for student use and for storage of books. Opening the Academic Computing Facility in the Student Mall consolidated over 200 computer seats from smaller labs into a single facility that includes four separate classrooms used by faculty for in-class instruction.

Library Utilization

The library keeps track of the count of patrons passing through its security system, and visits are at the highest levels ever. During the last two academic years, the number of patrons visiting the Van Houten Library has leveled off while the Architecture Library visits have tripled. This is widely believed to be the result of the library reaching maximum capacity in its 500 reader seats, over 100 computer seats, and 11 group study rooms frequently filled to capacity throughout the semester. The Van Houten Library circulation statistics show a 21% rise in borrowing of hard-copy materials over the past five years. There are approximately 7,500 AFS accounts that are actively used each semester. The Library Information Commons, the Student Mall Academic Computing Facility, and the GITC Computing Labs are all heavily used and available 7 days per week, but not 24 hours/day. The Student Mall Academic Computing Facility is kept open 24 hours/day for the last six weeks of the fall and spring semesters. Network usage logs indicate heavy network traffic from about 8:00 a.m. daily until 3:00 a.m. the following morning.

Process for Evaluating the Content, Procedures, and Technologies of Learning Resources

NJIT has several active planning and advisory committees with faculty and student participation (e.g., Library Committee, Teaching, Learning, and Technology Committee, and the Distance Learning Advisory Committee). Focus groups and open forums provide an opportunity for additional qualitative feedback. The LTLR student and faculty surveys conducted for the first time in 2001 will be continued on an annual basis. On an annual basis, the various planning and advisory committees should meet together to review agendas and common issues under discussion.

Journal Subscriptions

The library still subscribes to about the same number of print journal titles that it did five years ago (1,052 in 1999 vs. 1,016 titles in 1996). In 1992, at the last Middle States visit, the NJIT Library had 1,735 annual subscriptions, nearly all in print format. Today the library has access to articles in over 10,000 journal titles, all but 300 available
Participation in VALE (Virtual Academic Library Environment of NJ) has brought access to several major databases of journals at licensing fees lower than NJIT could have purchased alone. More importantly, there is significant usage of these databases with more than 85,000 documents downloaded in the year 2000 alone. In several disciplines, such as architecture, publishers still do not provide electronic journal subscriptions. Over the next five years, we can expect the number of print journal subscriptions to decrease as more electronic subscriptions become available.

Abstract and Indexing Search Tools

The number of abstract and indexes made available on-line has increased dramatically. Many of the databases have full-text/page-image articles as well as abstracts and indexes. Few hard copy abstracts and index subscriptions are needed or used anymore.

Article Delivery

For access to journals that are not available in print or electronic form at NJIT, the Library makes available a commercial article delivery service, INGENTA, from which the Library retrieves articles and provides them free of charge to faculty and students, generally within a 48-72 hour time period. This service has been accessed over 1,000 times in FY00, which is the lowest during the past six years.

Book Acquisitions

The library has increased its expenditures for books, nearly doubling the annual budget for such from 1994 to 2000. However, student enrollment and the demand for new titles, as well as the costs of book purchases have also significantly increased. Results on the student satisfaction survey show that students would like to see increases in the number of available book titles.

Library Technology

The Van Houten Library Information Commons was opened in 1997 and expanded in 2001. The Information Commons, a public computing facility with 104 computer workstations, 1 scanner, 4 printers and an information literacy training room. The Information Commons provides a convenient and relaxed atmosphere to search the Web, access electronic databases, view digital video and other electronic archives, or retrieve scholarly publications through digital library subscriptions – all with easy access to the library reference staff for assistance with access to on-line information resources. There are now 16 VCR stations located throughout the library for distance education, course videos, and feature films. The Architecture Library has an Information Commons with 16 computer workstations, 3 flatbed scanners, 2 slide scanners, 1 printer, and 2 digital cameras.

The library has licensed a new integrated library system, Endeavor’s Voyager, which has modules that will enable digital document management and discovery. Among Voyager’s other new features is the ability to allow users to remotely renew their books and materials. The system should be available in 2002. The library has begun the process of digitizing theses, dissertations, university archives, and other selected NJIT documents.
The library has set up special web pages for distance learning and off-campus access to library services. With use of the Virtual Private Network or a dial-up modem bank, remote library users have the same access to electronic library resources, as do on-campus patrons. Library Help and Tech Help, currently available in email, onsite, and over the telephone, will soon be offered through state-of-the-art, interactive, synchronous, chat and remote assistance.

**Leadership Within the State of New Jersey**

Library and IT professionals from NJIT continue to play a leadership role in both VALE, the Virtual Academic Library environment of New Jersey, and NJ Edge.Net, New Jersey’s Higher Education Network. VALE is a consortium of some 50 academic libraries, which brings consortium buying power for electronic databases and journals. The University Librarian, Richard Sweeney, is a member of the VALE executive committee and NJIT’s CIO chairs the NJ Edge.Net Network Advisory Board. Management operations for NJ Edge.Net are housed at NJIT. David Ullman, CIO, served as chair of the NJEDge.Net Advisory Board, and along with Peter Teklinski, Director of Telecommunications and Networks, currently serve as members of the Board.

Dr. Fenster co-chaired the *Higher Education Technology Task Force* of the Commission on Higher Education and the New Jersey Presidents’ Council which developed recommendations resulting in legislation creating a $50 million bond fund to support technology infrastructure at New Jersey’s colleges and universities. He subsequently chaired the New Jersey Presidents’ Council’s *Technology Advisory Committee*, which through his leadership and vision, recommended the establishment of a state-wide high-speed network supporting video and data applications for inter-institutional collaboration in teaching, learning, and research. NJEDge.Net, New Jersey’s Higher Education Network will go live in the early part of 2002. NJEDge.Net offices are housed at NJIT and NJIT’s CIO served as the founding chair of the NJEDge.Net Board.

**F. PLANNING AND RESOURCE ALLOCATION AND FINANCIAL RESOURCES**

**Financial Trends**

Prudent financial planning and resource allocation continue to support the university’s recognition of emerging trends in the economy, sciences and technology, anticipating their impact on society and development of appropriate educational and research programs. During the past ten years, direct State support for university operations has grown at a much smaller rate than the overall University budget, and now represents 35 percent of total revenue. For comparison, in FY90, State support represented 50 percent of total income. Figure 17 indicates the significant growth in revenue NJIT experienced in comparison to State appropriations. Figure 18 displays the major income sources for NJIT over the past ten years, indicating significant financial growth. Since FY92, total NJIT revenue has grown by 68 percent and totals $190.9 million in FY01. Another significant factor in growth at NJIT is the increase in research and development activities, which has grown from $26.2 million in FY92 to an estimated $52.1 million in FY01. Also, student tuition and fees have grown from $30.5 million to $59.7 million representing 32 percent of total revenue.
Figure 17: Financial Trends

Comparison of Total NJIT Income and State Appropriations

$ Millions


TOTAL NJIT: $113.0, $116.0, $124.0, $132.0, $145.0, $146.0, $157.0, $164.0, $176.0, $191.0

STATE SUPPORT: $50.3, $50.1, $52.1, $57.0, $57.7, $57.0, $58.0, $60.0, $64.6, $65.9

Fiscal Years
Figure 18: Major Income Sources FY1992 to FY2001

Comparison of NJIT Income Sources

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<tr>
<td>STATE APPROPRIATIONS</td>
<td>$50.3</td>
<td>$50.1</td>
<td>$52.1</td>
<td>$57.0</td>
<td>$57.7</td>
<td>$57.0</td>
<td>$58.0</td>
<td>$60.0</td>
<td>$64.6</td>
<td>$66.9</td>
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<tr>
<td>TUITION &amp; FEES</td>
<td>$30.5</td>
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<td>$35.0</td>
<td>$38.1</td>
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<td>$48.9</td>
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<tr>
<td>FEDERAL GRANTS &amp; CONTRACTS</td>
<td>$9.7</td>
<td>$10.8</td>
<td>$15.0</td>
<td>$17.5</td>
<td>$23.0</td>
<td>$23.6</td>
<td>$24.3</td>
<td>$24.1</td>
<td>$23.9</td>
<td>$25.0</td>
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<tr>
<td>STATE GRANTS, CONTRACTS &amp; OTHER</td>
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<td>$15.4</td>
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<td>$6.6</td>
<td>$5.7</td>
<td>$5.7</td>
<td>$6.0</td>
</tr>
<tr>
<td>ENDOWMENT &amp; OTHER SOURCES</td>
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<td>$1.6</td>
<td>$1.5</td>
<td>$2.9</td>
<td>$3.0</td>
<td>$3.0</td>
<td>$3.3</td>
<td>$4.1</td>
<td>$4.1</td>
<td>$4.9</td>
</tr>
<tr>
<td>AUXILIARY SOURCES</td>
<td>$4.9</td>
<td>$4.0</td>
<td>$4.2</td>
<td>$4.5</td>
<td>$4.7</td>
<td>$4.9</td>
<td>$5.9</td>
<td>$6.4</td>
<td>$7.1</td>
<td>$7.3</td>
</tr>
</tbody>
</table>

Figure 19 reflects expenditures for the nine fiscal years 1992 through 2000 and those projected for fiscal year 2001. This data highlights growth in four major expense categories:
**Academic** - includes the components of instruction, research, public service, academic support and student services.

**Support** - includes the operational components of administration and physical plant.

**Auxiliary Services** – includes residence halls and parking services.

**Transfers** – Primarily debt service, student aid and facility support.

Academic-related expenses have shown significant growth (68%) over this period while support expenditures grew by approximately 45%. The full Audited Financial Statement can be found in Appendix 24.

**Comments on Financial Trends**

- The university’s financial condition has been positive with expenditures occurring within the revenues available (Chart 4).
- Research operations continue to grow from expenditures of $19.4 million in FY 92 to an estimated level of $40.7 million in FY 01.
- State of New Jersey appropriations for general operations continue to represent a major component of the revenue. However, it is noted that revenues from tuition and fees are increasing more rapidly and reaching a support level nearly equal to the amount received in State support.
- Private support from corporations, foundations, alumni and other individual donors, has become an increasingly important factor in the university’s growth and development. The Office for University Advancement strategic planning is aligned with the priorities of the university with energies directed toward fund raising for
scholarships, fellowships, endowment, chairs and professorships, innovative education programs, non-contract research projects, grants to departments, colleges, and facilities improvement.

- The university has completed one of the most ambitious fund raising initiatives in its history - The Campaign for NJIT: Design for the Future. Launched in FY ’94, the focus of this seven-year campaign is endowment and scholarship. The goal of The Campaign for NJIT was $120 million - $44 from public and $76 million from private sources. The Campaign for NJIT is opening the door to a new era of academic opportunities – an era in which we can better respond to our students’ financial and academic needs. NJIT’s endowment and related funds have increased from $9.8 million in 1993, to $55 million in 2000.

- Since the campaign began, 200 new scholarships have been established. In the year 2000 alone, the endowment supported nearly 800 student scholarships, totaling $5,349,075.

Resource Development and Allocation Process

New Jersey Institute of Technology has maintained a budget resource development and allocation process with a strong emphasis on strategic planning. This process requires clear resource identification and assessment of the operational results. As displayed in Figure 20, this process is conducted on an on-going basis, closely aligned to the State of New Jersey fiscal cycle.

NJIT’s resource allocation process seeks to:
- Assess and determine how university-wide operational components relate to accomplishing the university’s strategic objectives,
- Determine the financial requirement to achieve the operational effect,
- Conduct operations on an annual basis within the resources available,
- Assess outcomes of operational programs, process and financial results,
- Communicate results to the university community and constituency.

Fiscal resources are developed and allocated through the annual budget process pursuant to university operating goals and objectives. These goals and objectives result from the university planning process. The Office of Budget and Fiscal Planning assists senior administrators, deans and department offices in coordinating operating budget development through on-going meetings. The Office of Budget and Planning, on an ongoing basis, analyzes revenue and expenditures relative to business plans and discusses results with appropriate management. In addition, the office conducts a major review of operations at the mid-fiscal year and end of the third operating quarter. The Senior Vice President for Administration and Treasurer is responsible for briefing the Boards of Trustees and Overseers at their respective meetings during the course of the fiscal year.

An independent accounting firm annually audits the university financial statements with results discussed with senior administration and the Boards of Trustees and Overseers. The opinions of auditors have consistently been unqualified with no material weaknesses indicated. Additionally, financial data are provided to the Office of Institutional Research for inclusion in the annual Institutional IPEDs data as well as various reports to the New Jersey Commission on Higher Education.
G. FACILITIES, EQUIPMENT AND OTHER RESOURCES

NJIT has developed a significant campus with much of it new or rebuilt in the last 15 years. As part of a State-wide effort to develop public higher education, NJIT (then NCE) underwent a major expansion in the 1966-1971 period. Prior to that the campus had consisted of two building complexes with no land not occupied by buildings. Beginning in 1979, after an eight year hiatus, there was an aggressive building program with, on average, the construction or major rehabilitation of a building a year. This building program has been planned to in response to, and in anticipation of the implementation of university goals. The continued growth of housing, structured parking, research space, business incubator capacity and technology infrastructure has served the university well. At the start of the new millennium, there are several major projects that are now underway.

Progress on campus development has been on-going. All of the projects that were in design or construction at the time of the 1997 Periodic Review Report were successfully completed on time and on budget. The Student Service Center which co-located the registrar, bursar and financial aid with a single point of contact has been particularly well received. In adjacent space the bookstore and the academic computing services with several large rooms for computer stations are also well utilized. In addition to these major efforts, there were a number of important renovations which addressed several issues as a coordinated effort. One such project was the replacement of certain doors to Tierman Hall. When the nearly 30-year old doors were replaced, the new mechanism included assisted opening capability. In addition, the doors were wired to be controlled with the ID card based magnetic strip which allows authorized entries at times when the building is otherwise secured with the swipe of the card and the stairs were replaced with
an attractive set of ramps to increase ADA accessibility. Other major projects include repairs to segments of a steam loop, replacement of several roofs, and HVAC equipment, fit out of new laboratories, upgrades to energy management and security systems and the development of on-line systems to track work orders, space utilization and floor plans.

The 1997 Periodic Report also discussed several facility needs that were in the discussion and or planning stages. Significant progress has been made on most fronts and the new building program discussed later addresses several issues that required more extensive facilities. However, it is worthy to note that NJIT through its resources and a special appropriation has 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.

In the spring of 2001, the NJIT campus consisted of 2 million gross square feet of built environment on a 48 acre campus. With the recently completed construction and major rehabilitation, the average age of campus facilities is 14 years. This is in spite of the original building dates of the pre-1967 expansion campus which includes Eberhardt Hall built in 1897, Colton Hall in 1911 and Campbell Hall in 1930. A more detailed report on the utilization of the facilities is included in the Appendix 25, which has tables which provide summaries by building with departmental and functional assignments.

The Next Phase of the Building Plan

The foregoing has been prologue to the next major phase of campus expansion. 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 19: Summary of the Building Plan Projects and Budget Allocations**

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Budget in $000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking Facility Addition</td>
<td>6,000</td>
</tr>
<tr>
<td>Residence Hall</td>
<td>17,500</td>
</tr>
<tr>
<td>Campus Center</td>
<td>45,000</td>
</tr>
<tr>
<td>Cullimore Hall Phases I and II (multiple purpose building)</td>
<td>37,000</td>
</tr>
<tr>
<td>Eberhardt Hall</td>
<td>4,000</td>
</tr>
<tr>
<td>Major maintenance Projects</td>
<td>13,000</td>
</tr>
<tr>
<td>Addition to Electrical and Computer Engr.</td>
<td>4,000</td>
</tr>
<tr>
<td>Enterprise Development Center III</td>
<td>15,200</td>
</tr>
<tr>
<td>Total</td>
<td>145,200</td>
</tr>
</tbody>
</table>
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 requires the demolition of the one-story Alumni Center which is 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 and 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.

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.

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.

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.

H. Visibility

In 1997, the Middle States team suggested that NJIT needed to make a stronger and more focused effort to enhance the reputation of the university and convey its accomplishments to a wider audience, within the state and nationally. One of the major objectives of the university was, and continues to be, an increase in name recognition along with a clearer picture of NJIT’s achievements and quality. Advancement and communications were reorganized, as described earlier in this document, and several new staff members were
added with specializations in communications, marketing, and development and coordination of events.

The Visibility Committee was formed to assist in the development of a market-oriented approach to promoting the university. The committee consists of the following participants: Deans of the six Colleges, Dean of Admissions, Alumni, faculty, students, and administrative personnel in communications, advancement, continuing education, and marketing. Forming the Visibility Committee provided an opportunity to gather the stakeholders responsible for building the reputation, projecting the image, and promoting the benefits of NJIT to share their ideas and participate in the planning process.

Data were examined to help summarize visibility issues. Figure 21, for example, shows results obtained in the IRP study of enrolling students, and results help to identify current sources of student information about NJIT. Students consistently learn about NJIT most often from friends, relatives and acquaintances. Results show the growing importance of high school teachers, principals and staff and the Internet as sources of information for students. Mail, including the catalog, appears to be relatively less important than they were. Little is gained through radio, television or billboard advertising. The referral from the athletic coach matters for some students, and we may see this grow as the athletic program continues to build. Monitoring marketing vehicles will continue to provide planning information.
Benchmark Study

A benchmark study of 600 New Jersey residents, 18 years of age or older, was conducted in April 2001 to learn about the general market perception of NJIT, to understand the image of NJIT held by the public, and to assist in planning next steps. The random-digit dial sampling method was employed and a structured telephone questionnaire was utilized to collect the data. The state was divided into three geographical regions (by county): north, central and south.

Overall, results were positive. As the Visibility Committee had suspected, those who are aware of NJIT, think very highly of the university. However, awareness of NJIT falls the farther south within the state an individual lives. Other interesting results included:

- Of the 600 respondents, 48% knew the university best as New Jersey Institute of Technology as opposed to NJIT (37%) or Newark College of Engineering (27%).

- The respondents who were familiar with NJIT rated us high on having a good public reputation, quality academic program, high quality computer resources and services, and top-notch professors. It is clear that the university had gotten the word out about being the “most wired public university” since the respondents who knew NJIT rated us high on computer resources and services.

- Those surveyed responded most favorably to the facts about NJIT dealing with research being conducted to improve New Jersey’s overall quality of life, such as gun safety and clean water.

- Forty percent of the respondents, who knew of NJIT, knew the university through a friend or relative.

Marketing Plan

Master Marketing Communications Plan and Individual Program Needs

The Visibility Committee addressed the marketing needs of the university with an umbrella plan. Each individual school, the research centers, and particular administrative programs also submitted strategic requirements. The full marketing plan is available in Appendix 26.

Revising the Marketing Mix

Part of the overall marketing plan is to reexamine how we utilize the marketing mix that accounts for the current promotional materials, including:

- Publications
- Advertising
- Media Relations
- Special Events
Publications

The Office of Communications crafts extremely professional publications that highlight NJIT’s many programs, activities, and services. In 2000, the Admissions Marketing Report honored NJIT with a bronze award for its outstanding “On-Line Viewbook” for undergraduate admissions. The number of publications has remained consistent as the university embarks on utilizing a broader mix of promotional tools like direct mail, PDF files, and the Web. Details of the publications under consideration are found in the Visibility Plan.

Advertising

The development, design, and placement of advertisements are other critical functions of the Office of Communications and an area that was revisited in the development of the integrated marketing communications plan. In order to facilitate consistency in message, to capitalize on price advantages, and to ensure our target markets are reached, NJIT has authorized the Office of Communications to be the sole buyer of advertising media. The Office of Communications researches all media requests from NJIT clients, negotiates the best price available, and purchases media on the client’s behalf. In addition, the Office of Communications is redesigning NJIT’s print advertisements to improve the image and consistency in message. In order to plan and implement print advertising campaigns that more successfully meet the university’s target audiences and enhance the marketing effort, systematic feedback will be obtained from those audiences.

In the process of reviewing the overall advertising mix, it was determined that the university needed to increase its advertising budget to secure and upgrade placement in new and existing media. The advertising budget was increased by 175% from 1998 to 2001 to accommodate these goals.

Media Relations/Public Relations

As part of the overall marketing effort, NJIT will continue to cultivate relationships with the local press and journalists while reaching out nationally, offering stories that have broad appeal. Each department and/or event at NJIT is being evaluated regarding the amount of media attention it needs or can attract.

Capturing University News

A number of processes have been put in place to capture new information and happenings concerning NJIT students, faculty, staff, and programs. First, the faculty resource guide is in the process of being updated. This process provides an opportunity for the Office of Communications to “get to know” the faculty, their specialties, and the type of research being conducted at the university. It is also a great resource for the media when journalists are soliciting subject matter experts for a breaking news story or a feature article.

Secondly, the NJIT newsletter has been redesigned and is now distributed electronically on a bi-monthly basis. News@NJIT provides information on faculty achievements, student accomplishments, academic appointments, campus happenings, research projects, human-interest stories, etc. Moreover, the NJIT community can easily provide this type of information to the Office of Communications electronically through GotNews, a
simple form that can be accessed from the NJIT home page, the e-newsletter, and the alumni and faculty/staff home pages. This process has begun to be embraced by the university community and continues to grow, becoming a good source for sharing timely information.

Lastly, in order to more effectively promote NJIT to a wider audience and strengthen our national reputation, we incorporated our strengths – science and technology – into a project that would enhance the university’s image while appealing to a general audience. Our idea was to develop the “NJIT Technology Poll.” The poll is conducted quarterly and intended for media release with the goal of increasing public awareness about the university, showcasing faculty members in their respective areas of expertise, and presenting NJIT as a reliable and credible resource for issues relating to technology.

The first poll was conducted in June 2001 on the topic of energy in conjunction with NJIT’s charge from the State of New Jersey to lead an energy consortium. The consortium’s mission is to examine supply, demand, and pricing of energy while planning for the future needs of the state. The results of the NJIT Technology Poll were widely published in August. The second poll was completed in October 2001 and it complemented work being funded at NJIT on k-12 outreach in science, math and technology education. Results were published in October.
VIII. THE STRATEGIC PLAN

STRATEGIC CONSIDERATIONS

Overall, it is the strategic objective of the university to achieve such high levels of accomplishment, as measured by student, research and economic development outcomes, as to receive widespread recognition throughout the academic, business and general communities. Through recognition and enhanced visibility, still greater accomplishment will come in recruitment of students, faculty and staff, enhanced pride of alumni, and the support of additional constituencies who value what NJIT does and who want to associate themselves with the university. To these ends, the strategic plan encompasses eight general areas for action.

The responsibility for executing the strategic plan is the responsibility of the entire NJIT community, and the success that is reached in implementing the plan is a function of the talents, energy, and dedication of the students, faculty, staff, and administration of the university. The Office of Institutional Research and Planning will continue to monitor the achievement of the goals of the strategic plan, and the process will be overseen and ensured by the Long Range Planning Committee.

The following is the statement of the goals, objectives, and strategies developed in the strategic planning process, based on the work and analysis performed by the Middle States Steering Committee and all of its subcommittees in collaboration with the whole of the university community.

New Jersey Institute of Technology has come a long way in its quest to meet the challenge of Governor Thomas Kean twenty years ago, that NJIT take its place among the premiere technological universities in the nation. We have planned well and implemented well. We have been steadfast in our advocacy for the state to be recognized as one which is strongly technology intensive and technology dependent. We believe that the state needs a world class technological research university and that NJIT must continue to strive to be that institution. The self-study presents ample evidence of our progress and we shall not repeat particular outcomes here. We must, however, in planning strategically, set down what are the major drivers of our future, and we must do so in a way which is clear an unambiguous:

1. The enrollment, both undergraduate and graduate, cannot grow without limit. Enrollment growth must be moderate so that selectivity can be enhanced. With only moderate growth in enrollment, NJIT can achieve a better match between resource requirements and resource availability. It can increase its reputation. This should prove of great value in fund raising, in the recruitment of distinguished faculty, in the attraction of gifted students, in improved retention and graduation rates, and consequent to the foregoing, in improved national rankings. In terms of undergraduate enrollment, the fraction of students who select the university because of the attractiveness of its honors offerings should increase, within the capability of the university in terms of scholarship support.
2. Research activities should continue to be focused on areas important to the state and national economies. The number of faculty and other technical professionals actively engaged in research and related activity must increase to maximize overall performance. In order to achieve appropriate critical masses of talent and to optimize use of facilities and equipment, the university must continue to seek partnerships with universities, businesses, and government agencies.

3. The university will continue to regard economic development in its various aspects as critical to the comprehensive mission of a technological university. This mission includes the education of professionals, the generation of new knowledge and economic activity through research and development, and the generation of new business entities through its incubator program and other initiatives in which business related activities are conducted on campus with student and faculty involvement.

The three strategic elements cited above do not sit in isolation, but on the contrary, should be regarded as strongly synergistic. The three should be viewed as a whole, not disaggregated, as each element is related to the others.

On the following pages are specific steps which should be taken to implement the bold strokes cited.

A. STUDENTS AND STUDENT LIFE

GOAL A.1: Achieve optimal enrollments and enrollment mix of students to achieve best match of university resources and students based on the development of new academic programs, analysis of data regarding retention expectations, the growing pool of high school graduates, and the increasingly enhanced reputation of the university.

OBJECTIVE Continue to reach limited enrollment increases to a headcount of approximately 9,500 by the year 2005, raising academic requirements. Maintain the mix of approximately 2/3 undergraduate and 1/3 graduate students.

STRATEGIES:
1. Increase endowed funding support for talented students.
2. Increase the proportion of Honors College students to total enrollment.
3. Expand activities to increase the visibility and reputation of NJIT in order to attract outstanding faculty and excellent students.
4. Continue to refine and improve recruitment publications and activities to increase visibility, reputation, and general awareness of the quality and scope of the educational opportunity at NJIT.
5. Continue to lead outreach activities and maintain and build pre-college links with schools as well as links with community colleges. Continue to develop joint admissions programs with community colleges.
6. Increase alumni involvement in recruitment activities.
7. Add 2+2 degree program options.
8. Focus recruitment activities, especially transfer enrollment, for the Mt. Laurel campus.

OBJECTIVE: Optimize services for the increasing number of part-time students who are working adults participating in continuing education programs or courses.

STRATEGIES:
1. Continue to maintain and build links with employers of potential continuing education students, including NJIT alumni.
2. Continue to develop and enhance flexible modalities of instruction and advisement and learning support (e.g., distance learning, web access to resources).

GOAL A.2: Attract and retain high-performing, committed students.

OBJECTIVE: Revise and enhance student recruitment and admission process.

STRATEGIES:
1. Target recruitment efforts toward well-prepared, committed students and continue to develop admission standards and procedures that allow the best fit of well-prepared and committed students to emerge in the admission procedures.
2. Continue to review and raise admission standards as appropriate to optimize the match between the rigor of programs and student preparation to perform academically. Encourage regular program-based review of admission standards.
3. Create information databases to support placement testing and advisement procedures.
4. Review and revise placement testing procedures and policies and continue to revise and improve placement and advisement procedures.

OBJECTIVE: Provide a challenging Honors curriculum, as outlined in the current strategic plan of the Albert Dorman Honors College.

STRATEGY:
1. Develop more upper-division Honors courses, seeking additional support from NJIT Tower Project and from other public and private sources.

OBJECTIVE: Increase interaction between students and faculty beyond the classroom.

STRATEGIES:
1. Encourage faculty to develop activities and opportunities for interaction with students beyond and outside the classroom.
2. Attract and retain faculty who will serve as role models for the diverse population served by NJIT.
3. Increase research assistant opportunities for undergraduate students as well as graduate students who can provide additional opportunities for faculty-student interaction.

OBJECTIVE: Continue to assess the optimal proportion of residential to commuter students and monitor the need and opportunities to expand residential housing as is appropriate.
STRATEGIES:
1. Continue to monitor housing requests of students.
2. Continue to develop and enhance campus life and support for residential students.
3. Develop the residential building program as appropriate to meet new residential student targets beyond the current full-capacity housing.

OBJECTIVE: Enhance student entrepreneurship opportunities.

STRATEGIES:
1. Increase number and quality of cooperatives and internships.
2. Enhance activities of student “incubators.”
3. Disseminate information about the best student entrepreneurial experiences to help promote and encourage the growth of student entrepreneurial opportunities.

OBJECTIVE: Continue to develop the athletics program to enhance student participation, commitment, student loyalty, and university visibility.

STRATEGIES:
1. Evaluate current intercollegiate athletics programs, policies and procedures as they relate to the history of specific sports, coaching, facilities, budgets, and sports sponsorship.
2. Based on information obtained in these two exercises, develop a specific plan of action for NJIT and implement the plan.

GOAL A.3: Maintain and improve levels of student diversity, reflecting the diversity of the wider population and the communities served by the university.

OBJECTIVE: Increase enrollment of women students at NJIT to 30% by 2005 (women in engineering to 20%);

OBJECTIVE: Increase enrollment of underrepresented minorities to 40% by 2005 (with a 10% increase, respectively, in the number of African-American and Hispanic students).

STRATEGIES:
1. Strengthen direct links to target high schools.
2. Modify and enhance student recruitment strategies.
3. Promote a campus culture that further welcomes and supports diversity in students and faculty.

GOAL A.4: Improve retention and graduation rates to those that equal or exceed rates for comparable institutions.

OBJECTIVE: Achieve 90 percent freshman to sophomore retention rate and 55 percent 6-year graduation rate within 5 years.

STRATEGIES:
1. Improve dissemination of career and program information to students in the pre-recruitment outreach activities, recruitment, and orientation
proceedings. Implement the Pre-Engineering Instructional and Outreach Program (PrE-IOP) workforce development grant.

2. Improve processes which provide students with early career-related experiences and projects to improve student understanding of the quality of activities and opportunities associated with career choices.

3. Increase faculty and staff understanding of student development principles through workshops, publications, and other faculty and staff development activities.

4. Set benchmarks for improvement of instruction and increase faculty involvement in teaching and learning workshops.

5. Monitor student satisfaction with NJIT experience and continue to benchmark and improve student levels of satisfaction with different aspects of the university experience.

6. Acting on the findings of the retention study: Continue to build and enhance academic tutoring and other academic support capabilities as well as advisement procedures that monitor and address student performance. Continue to develop opportunities to reduce student need to work outside the university excessively, including examination of financing needs and opportunities as well as advisement that emphasizes the importance of moderate workloads.

7. Increase student passing rates in the general undergraduate requirement (GUR) courses.

8. Continue to monitor student performance, faculty grading practices and instructional strategies in delivery of GUR courses.

**GOAL A.5:** Enhance and enrich student interaction and involvement on campus.

**OBJECTIVE:** Increase student satisfaction levels with campus activities outside the classroom (e.g., cultural, community service, recreational, and social activities and services).

**STRATEGIES:**

1. Continue to analyze the quality of campus life based on results of student satisfaction surveys and focus groups, implementing appropriate improvements and new programs.

2. Based on the analysis, develop programs tailored to student feedback.

3. Intensify efforts to increase student participation in available activities.

4. Increase the availability of organizations and events in which students wish to participate. Conduct surveys or focus groups to help collect additional information about student activities, interests and issues.

5. Continue to improve the quality and availability of recreational facilities.

**OBJECTIVE:** Student satisfaction survey will report greater satisfaction with “staff concern for students as individuals.”

**STRATEGY:**

1. Continued development of staff through orientation, workshops and other staff development support; staff will apply principles of customer focus and customer service.
B. THE ACADEMIC PROGRAM

B.1. FACULTY

GOAL B.1.1: Continue to transform faculty instructional, research and service activities into increasingly student-centered models.

OBJECTIVE: Student satisfaction survey will report higher levels of faculty enthusiasm for teaching, out of class availability of instructors, and instructor concern for students as individuals.

STRATEGIES:
1. Continue to emphasize teaching effectiveness as a critical factor in faculty hiring, promotion, and tenure.
2. Ensure the greatest possible opportunities for faculty pedagogical development, research, and other intellectual activity.
3. Increase interaction and dialogue in the learning process.
4. Increase faculty and staff understanding of student development principles.
5. Involve faculty in participation in teaching and learning workshops.
6. Increase interaction and dialogue through increased faculty/student work on research and service projects.
7. Make the hiring and P&T process more open to the entire academic community so that faculty can perceive how seriously department and university committees view teaching effectiveness.
8. Recommend that academic administrators teach at least one course every academic year to manifest their personal regard for the value of teaching.
9. Consider scheduling policies that involve distinguished and full professors in lower-division undergraduate course instruction each academic year to manifest commitment to effective teaching across the curriculum.

OBJECTIVE: Continue to maintain that the standard for teaching may be found in student learning outcomes. Continue to monitor, study, report on, and act on research on student learning outcomes, including best-practices research.

STRATEGIES
1. Continue and expand the current program of learning outcomes research for both undergraduate and graduate instruction, as well as for distance learning instruction.
2. Encourage each department to continue to study and analyze the performance of its recent graduates and current seniors to affirm that student performance needs in the marketplace are being met and that standards have been maintained.
3. Stress the importance of the senior project or capstone course as a way of assuring that the students are achieving at the appropriate level.
4. Request that each department meet regularly with its majors and to report to the university at large the issues that students bring up as
helping or hindering their progress through the curriculum to assist in the process of continual teaching and learning improvement.

OBJECTIVE: Further increase the use of computing equipment and library services so that faculty can make optimal applications for instructional strategies.

STRATEGIES:
1. Improve faculty and staff training for use of computing and information technology to improve teaching and learning, i.e. with an approach from good pedagogy.
2. Use most recent software tools in various disciplines.
3. Further improve the “connectedness” between faculty and students.
4. Move some traditional face-to-face courses to an on-line environment and eventually have most courses available in a distance-learning mode as well as in face-to-face classrooms.
5. Create full 7x24 hour student and faculty support structure.

GOAL B.1.2: Increase the number of women and under-represented minority faculty.

OBJECTIVE: Have the composition of faculty relative to minority status and gender better reflect the make up of the student body.

STRATEGY:
1. Encourage promising women and under-represented minority students to pursue doctoral degrees at NJIT in science and engineering and provide financial incentives to that end.

B.2. UNDERGRADUATE EDUCATIONAL PROGRAM AND CURRICULA

GOAL B.2.1: Consider student interests, student career aspirations, and the creation of opportunity for student achievement and contribution to intellectual, social and economic enterprises in the development of new programs.

OBJECTIVE: Continuously study and apply information regarding student interests and opportunities to prepare to make meaningful contributions in the social and economic arenas in building programs and curricula.

STRATEGIES:
1. Continue to consider market development and opportunities, national economic and social priorities, the thrusts of funding support, and national resources in program development.
2. Monitor and assess enrollment trends as an index of student interest and anticipate meeting student need.
3. Collect, review and apply information about student interests and goals.
4. Continue to collect and review data such as the enrolling student survey, graduating student survey, and alumni survey data on goals and educational and career interests.
**Goal B.2.2:** Emphasize and capitalize on the distinctiveness of NJIT academic programs.

**Objective:** Continue to provide a foundation of science and technology in the curricula for all students and for all majors.

**Strategies:**
1. Continuously revise curricula to include most recent technological developments and study of technology issues and problems.
2. Build curricular components to foster teamwork, oral and written communication skills, and awareness of the impact of science and technology on society.
3. Continue to expand the use of technology in instruction, student projects, and for communication within and across courses and programs. Increase technology resources dedicated to instruction.
4. Using New Jersey Information Tower Project (NJ I-Tower), NSF, and other resources, develop new courses and modify existing courses to make them more challenging and motivating for students and meeting the needs of industry.

**Objective:** Provide a context-based curriculum.

**Strategy:**
1. Continue to broaden the application of context-based applications in instruction across the curriculum. Apply strategies such as those currently used in FED courses across programs and courses of the university.

**Objective:** Continue to expand the international scope for NJIT’s education, research and service missions.

**Strategies:**
1. Continue to develop the number and type of international educational programs offered in collaboration with universities and colleges worldwide, delivering programs and courses in appropriate institutions. Expand international presence in both traditional in-class and distance learning modalities.
2. Continue to participate in international research projects and programs, and participate in international forums on research and education.
3. Encourage faculty to interact with international counterparts to establish international research and educational programs.

**Goal B.2.3:** Increase engineering student pass rates on Fundamentals of Engineering (FE) licensure examination.

**Objective:** Increase student pass rates from the current levels of approximately 20-32% (45 to 50% for current students, 16% for alumni) to 60% (80% for current students) by 2004.

**Strategy:**
1. Encourage current students to take the FE examination. Use one-on-one advisement and a mail campaign to encourage current students to take the FE examination.
2. Contact all students who apply to take the exam and encourage them to take an NJIT-provided review course as well as the review short courses leading up to the exam date in fall and spring.

3. Require all engineering students at NJIT to take the Basic Engineering Skills Test (BEST) in the fall of their senior year. The BEST exam is an assessment tool and is modeled after the FE exam. It provides a mock FE exam and prepares the student for the FE exam.

**GOAL B.2.4:** Forge increasingly stronger industry-university cooperation to ensure that the most current business and industry needs for knowledge and skills are being met in the curricular design of NJIT programs.

**OBJECTIVE:** Determine new points of connection between NJIT programs and industry.

**STRATEGY:**
1. Increase advisory board members’ participation in reviews of specific curricula.

**OBJECTIVE:** Improve the alignment of courses and curriculum with the needs of industry as expressed by the advisory process.

**STRATEGIES:**
1. Enhance departmental engagement with content-specific industry advisors.
2. Charge course coordinators/supervisors with maintaining currency and appropriateness of course material and assignments.
3. Emphasize teamwork, communication skills, interdisciplinary research, creative problem solving, and community service.
4. Maintain ongoing communication with program advisory boards in order to utilize their collective knowledge and resources.

**GOAL B.2.5:** Expand multidisciplinary and interdisciplinary approaches in instruction.

**OBJECTIVE:** Foster natural and practical collaborations across departments and majors.

**STRATEGIES:**
1. Increase the integration of disciplines in introductory courses in appropriate academic majors.
2. Implement a team-teaching initiative among programs and courses in various majors, departments and schools.

**B.3. GRADUATE STUDIES AND RESEARCH**

**GOAL B.3.1:** Provide research experience for all undergraduate students.

**OBJECTIVE:** Increase the opportunities for undergraduate students to participate in research.
STRATEGIES:
1. Include a research component in all capstone courses.
2. Make available to all students the option of a senior thesis or project. Provide a system for identifying and publicizing research opportunities on and off campus.
3. Provide incentives for faculty to engage undergraduate students in research projects.

GOAL B.3.2: Continue to enhance NJIT’s status as a nationally recognized research university.

OBJECTIVE: Increase the number of enrolled Ph.D. students annually.

STRATEGIES:
1. Expand the number of graduate programs to reflect expertise and opportunities for NJIT.

OBJECTIVE: Increase the number of faculty who are fellows of their professional societies and members of national academies.

STRATEGIES:
1. Identify appropriate candidates for election as society fellows and academy members.
2. Initiate appropriate application/election procedures for candidates.
3. Encourage faculty to engage in activities and to perform in a manner that enhances opportunities for these roles, and recognize those who achieve fellow and member status.

GOAL B.3.3: Increase annual external research support from current levels to greater than $50 million as a result of growth in the number and size of grants awarded.

OBJECTIVES
1. Increase the number of faculty at NJIT who are research active.
2. Continue to direct university structure and policy to encourage research and support faculty opportunities to build research programs.
3. Increase the number of industrial and corporate personnel involved with NJIT in order to develop enhanced opportunities for joint research projects.
4. Maintain NJIT’s flexible teaching load policy, consistent with the goals of a comprehensive technological research university.

STRATEGIES:
1. Define and articulate thematic research areas to the academic community and funding stakeholders alike.
2. Develop cross and multi-disciplinary projects that engage internal and external partners and are consistent with the major themes for university research.
3. Increase the presence of applications-focused development center (e.g., not-for-profit Polymer Processing Institute, N.J. Energy Consortium, N.J. Transportation and Planning Authority) as a mechanism for establishing
contracted development projects that can seed longer range, academic basic research.

4. Formalize interactions with the state’s military research and development centers (U.S. Army Picatinny Arsenal, Ft. Dix Battlefield Technology Training Labs, Fort Monmouth CECOM, US Navy Lakehurst) to develop ongoing partnerships that increase DoD funder programs to the levels characteristic of a national research university.

5. Develop and implement a featured information management system that includes: active listing of grant sources and requests for proposals with active notification to university principal investigators of relevant opportunities; on-line proposal generation supported by electronic forms and workflow management; on-line library of faculty publications and associated data management tools to allow external stakeholders to identify relevant expertise; open reporting of performance metrics on an individual and aggregated basis.

6. Add institutional resources for identifying new research opportunities, preparing proposal narratives, and assisting in project management of existing, large scale research efforts.

7. Continue to aggressively hire new faculty members consistent with the university focus areas with demonstrated aptitude in academic research as a critical factor in discriminating among candidates.

8. Continue to work with state agencies and others to develop new mechanisms to support start-up funding for new faculty members (e.g., N.J. Commission on Higher Education Capacity Building Fund).

9. Actively promote the Collaborative Doctorate program to the state’s high-tech industrial sector.

10. Develop industrial advisory boards for the university’s new cross-disciplinary councils, and encourage all academic program industrial advisory boards to designate R&D sub-committees to guide development of a local research strategy.

11. Increase indirect cost recovery on funded research to allow a greater ability to reinvest in matching load relief for research active faculty members.

12. Provide proportionate allocation of funded load relief to the respective college and department to reinvest in both instructional and research support.

13. Increase the number of full-time technical professionals available to instructional programs by increasing the number of programs and resident organizations engaged in research and development through self-sustaining external funding.

**GOAL B.3.4:** Increase faculty research productivity/publication.

**OBJECTIVE:** Increase faculty publication of research in refereed journals.

**STRATEGIES:**

1. Continue considering scholarly publication as a metric for promotion and tenure with a fair and consistent set of norms established and disseminated that are appropriate to each college and discipline.

2. Improve faculty self-reporting of publications by creating an on-line library to actively promote university research capabilities.
GOAL B.3.5: Improve the academic preparation and performance of graduate students.

OBJECTIVE: Set higher academic preparation standards for incoming students.

STRATEGIES:
1. Continue the current 550 score for TOEFL and allow increased levels for some programs.
2. Establish a level of 1800 composite GRE for admission to the CS and IS Master’s and Ph.D. programs. Establish higher GRE levels for all other programs.
3. Communicate GRE or GMAT requirements to the BS/MS population.

OBJECTIVE: Improve the completion rate of graduate Ph.D. students to 70% or more.

STRATEGIES:
1. Continue to monitor Ph.D. academic progress on an individual basis.
2. Continue enrichment of Ph.D. programs and opportunities for growth and research for Ph.D. students.
3. Expand the Teaching Assistant Training program.

B.4. DISTANCE LEARNING AND INSTRUCTIONAL TECHNOLOGY

GOAL B.4.1: Continue to increase the quality and consistency of delivery of distance learning instruction and distance learning support services for both credit and non-credit courses.

OBJECTIVE: Maintain and raise standards in all opportunities to collaborate, cooperate, and/or partner with internal and external constituencies where distance learning enhances the capability to deliver quality educational programs. Such entities include internal groups as well as domestic and foreign colleges and universities, corporations and professional associations.

STRATEGIES:
1. Develop standard procedures to evaluate proposed partnerships.
2. Use NJIT forums as a means of communicating with intended constituencies.
3. Provide faculty with new and enhanced opportunities for IT professional development.

OBJECTIVE: Continue to build the scope and volume of distance learning offerings to accommodate the market and capitalize on NJIT’s expertise, increasing sophistication and know-how, and opportunities for service.

STRATEGIES:
1. Organize and conduct regular annual national and international conferences on distance learning.
2. Document and disseminate new developments in distance learning delivery at NJIT at an accelerated rate.
3. Increase and improve advertising of distance learning and enhanced technological programs, including both for-credit and not-for-credit offerings.
4. Ensure that the distance learning home page appropriately reflects the quality and level of technical sophistication of NJIT’s distance learning programs.

**GOAL B.4.2:** Establish and expand the use of best practices in distance learning and other new instructional modalities.

**OBJECTIVE:** Continue to assess distance learning courses, improve student response rate, and apply findings to development of distance learning instructional methodology.

**STRATEGIES:**
1. Present findings of research on best practices to faculty and use workshops to disseminate and to develop instructional strategies that respond to findings.
2. Advertise the university’s distance learning offerings with equal emphasis on their academic quality as well as their convenience to students.

**GOAL B.4.3:** Utilize technology to facilitate communication among all members of the campus community.

**OBJECTIVE:** Accelerate development and implementation of on-line administrative systems.

**STRATEGIES:**
1. Make all transaction systems web-based by 2005
2. Continue to implement a campus Intranet.
3. Increase wireless capabilities across campus.
4. Continue to improve the appearance and functionality of the university web site.

**GOAL B.4.4** Continue to infuse the educational experience with the advantages and opportunities presented by technology.

**OBJECTIVE:** Continue to provide advanced technological support to NJIT faculty.

**STRATEGIES:**
1. Provide a course website for each course. Course instructors and coordinators will be encouraged and assisted in making optimal use of this resource for courses.
2. Increase the number of technology-enabled classrooms throughout the campus.
3. Add mobile computing capabilities to classroom/studio buildings.
4. Continue to provide ongoing in-service support for faculty who currently teach DL courses, and assist faculty who want to develop new DL courses by engaging them in the Teaching, Learning, and Technology Roundtable activities.
5. By the year 2006, 80% of classrooms will have computer projection devices.
6. Issue notebook computers to the faculty who heavily use them.
7. Acquire two “Mobile Computer Classrooms” (i.e. notebook computers, combined with wireless computing that can be used in a traditional classroom).
8. Locate new computer classroom facilities in close proximity to support staff and design those facilities in a manner that will allow their use as open public facilities when not in use by a class for teaching.
9. Increase and improve campus computer printing capabilities.
10. Improve faculty satisfaction with computing support services.

OBJECTIVE: Provide advanced technological support to NJIT students.

STRATEGIES:
1. Continue to customize the freshman PC distribution program including software for each college’s needs.
2. Improve student satisfaction with computing support services.

C. LIBRARY, TECHNOLOGY AND LEARNING RESOURCES

GOAL C.1: Become a leader among colleges and universities in the State of New Jersey and among research universities at a national level, for the innovative use of libraries, information, computing, and technology to support teaching, learning, research, and administration.

OBJECTIVE: Enhance the NJIT library as a major information resource for students and faculty.

STRATEGIES:
1. Make the library a central repository for providing access, coordination, and classification of on-line courseware.
2. Provide NJIT community with universal access to the library and information services available through the NJIT network at any time and from almost any place where they are working or studying (library, home, or other campus location).
3. Provide customer-centered and responsive library, information, and technology support structures for training and facilitation.
4. Provide assistance in courseware development utilizing new forms of communication, information access, and computational efficiency.
5. Revise appropriate intellectual property policies in the virtual arena.
6. Continue to develop an on-going and coherent planning, evaluating, and budgeting process for library, information, and technology resources.

GOAL C.2: Use information, technology, and library resources to enhance the learner-centered university experience.

OBJECTIVE: Learners should be able to access course content, obtain advice and guidance, submit assignments, exchange documents, and access student services in a variety of methods, including those mediated by information technology.
STRATEGIES:
1. Continue to expand appropriate programs to assess and develop information and technology literacy and competency for all NJIT students.
2. Continue to deliver web-based tutorials, teach formal classes, and provide individual tutoring, applying standards published by the Association for College and Research Libraries.
3. Determine a base level of literacy and competency and help identify student weaknesses, pre-test every incoming student as part of the freshmen orientation, and post-test every student prior to graduation.
4. Propose to appropriate state, regional and national organizations a shared web site that would include interactive information and technology literacy/competency encyclopedia, textbook, and other resources.

OBJECTIVE: Continue to improve the facility, operation, and the content of the library.

STRATEGIES:
1. Increase the library’s hours of operation to 24 hours for weekdays during the fall and spring semesters.
2. Expand the number of group study rooms from 11 to 20, establish ten 2-person group study facilities, and add additional 172 seats.
3. Continue to work with the Virtual Academic Library Environment (VALE) of New Jersey to solve problem of slow lender response time.
4. By 2004, make a 20% shift in funding from hard-copy journal subscriptions to funding for electronic journal subscriptions.

GOAL C.3: Continue developing library services and collections to increase access to information in order to meet fully the needs of a comprehensive technological research university.

OBJECTIVE: Extensively use technology to access electronic journals and collections.

STRATEGY:
1. Continue the university’s investment in high-speed local area networking, ubiquitous access to multi-media capable personal computing systems and high-bandwidth, broadband connectivity to external information resources.
2. The library will develop and implement a “My Library” gateway to NJIT digital library services, which will help users to customize their information interface.
3. By 2004, make a shift in funding from hard-copy journal subscriptions to funding for electronic journal subscriptions.

D. ECONOMIC DEVELOPMENT

GOAL D.1: Continue to serve the economic development needs of the city of Newark, the State and northeastern United States in consideration of and participation in the global economy.
OBJECTIVE: To make the best possible use of NJIT’s expertise and resources in service to its constituent communities.

STRATEGIES:
1. Continue to develop and expand University Heights Science Park in cooperation with other members of the Council for Higher Education in Newark. Fully occupy “60 acres” of Science Park with high tech research and development and manufacturing organizations.
2. Expand the resources and activities of the Office of Economic Development and the University Patent Committee to expand support for technology transfer and licensing to faculty, staff, and students who seek to commercialize their inventions.
3. To meet growing demand, establish the third small business incubator for technology-based firms using a university building and incorporating the return of purchase price in the lease structure. Achieve the goal of including approximately sixty companies in incubator facilities.
4. Increase support for Phase II start-ups, including prototype and small business or production support.

OBJECTIVE: To generate a reliable income stream to the Foundation from license fees and equity share in businesses derive from university economic development.

STRATEGIES:
1. To seek and secure donation of “shelved IP” from the corporate sector that is consistent with NJIT’s research focus areas and commercialization abilities.
2. Improve faculty and student knowledge of the patent process and protect intellectual property earlier in the concept-generation phase.
3. Proactively screen research and development efforts to identify patentable concepts and facilitate preparation and filing of disclosures.
4. Create and implement a board of external business advisors to evaluate intellectual property from the standpoint of commercial impact.
5. Develop institutional resources for marketing, negotiation of licenses, and the monitoring of infringement on university intellectual property.

E. PLANNING, RESOURCE ALLOCATION, AND FINANCIAL RESOURCES

GOAL E.1: Maintain a financial system that combines the operational flexibility with fiduciary responsibility to its public and private supporters.

OBJECTIVE: Improve the budget planning process.

STRATEGIES:
1. Expand the financial/budget modeling process to more intensively include college deans and vice presidents, utilizing this as an interactive planning modeling tool.
2. Integrate the results into an on-going budget planning process, identifying resources required and assessing the impact on the university’s strategic goals.
3. Identify additional sources of revenue in collaboration with deans, vice presidents, and other senior university officials.
4. Provide various funding scenarios, offering a broader understanding of financial restrictions to senior administrators.

5. Develop a framework for departments and centers to use in developing the business plans in order to improve accuracy in identifying and assessing needs and to provide comparable data.

6. Improve business expertise by providing assistance to centers by creating “business support teams.” The Budget and Fiscal Planning Office will assist deans and area directors in translating financial, enrollment and other related information into data that can be used for business planning. Business support will focus on issues such as: cost planning, process improvements, capacity analysis, customer service, cost vs. value drivers.

OBJECTIVE: Improve budgeting process by more effective use of modern technology.

STRATEGIES:

1. Expand the use of NJIT’s web page to facilitate the dissemination of budget data, information on the budget process, and funding results from the State of New Jersey, and regulatory information on grant operations, and to publish assessment information including material excerpted from the audited financial statements. This would build upon the current use of e-mail and filing of budgetary information at the NJIT Library reference desk.

2. Develop new resources through the acquisition of intellectual property and the promotion of enterprise development/business ventures. Seek the support of outside business consultants to determine the feasibility and establish an operational framework to examine these options.

OBJECTIVE: Prepare staff for the budgeting process by training and development.

STRATEGIES:

1. Expand the in-house training program to focus on strengthening the business and management skills of faculty and administrators to improve the management of resources, avoidance of regulatory problems and identification of new business opportunities as well as new revenue. To this end, develop an in-house training curriculum and offer it on a regular basis. The curriculum will focus upon:
   ~ Fostering business skills in administering a cost center. Expand current FRS training to administrator-level courses, utilizing on-line and printed reports applicable to their unit or cost center activity.
   ~ Improving entrepreneurial skills to develop alternate revenue sources.
   ~ Providing on-going education on changing accounting, tax and regulatory rules and regulations, and their impact on how the university conducts its operations.

2. Apply emerging technologies in relational database systems and use commercially available computer programs to expand the management tools available to faculty and administrators. Areas important to mission objectives include:
   ~ Evaluating current service-based computer server software to determine future requirements, examine software capabilities
and develop appropriate technology related strategies for the university.

Expanding the use of management reports utilizing the university's server-based systems (FRS, HRS, SIS, etc.), developing reports that are immediately available on-line or via e-mail for faculty and administrators’ review.

3. Expand data warehousing and electronic printing techniques, thus reducing operational costs and space requirements.

F. FACILITIES, EQUIPMENT AND OTHER RESOURCES

**GOAL F.1:** Improve older facilities and construct new facilities to more fully meet the requirements of a global research university.

**OBJECTIVE:** Allow easy and safe access to all facilities for all students.

**STRATEGIES:**

1. Complete the program of assisted opening capability to all NJIT buildings.
2. Equip all entrance doors with the devices controlled by the ID card base magnetic stripe which allows authorized entries only.
3. Replace or complement stairs with a set of ramps to increase ADA accessibility.

**OBJECTIVE:** Conduct all maintenance to improve the operation of current facilities.

**STRATEGY:**

1. Repair segments of a steam loop, replace several roofs, and HVAC equipment, fit out new laboratories, upgrade energy management and security systems and develop of on-line systems to track work orders, space utilization and floor plans.

**OBJECTIVE:** Provide adequate facilities to meet NJIT immediate needs.

**STRATEGIES:**

2. Secure funding for construction and maintenance projects.
3. Make the appropriate investments in on-campus buildings.

**OBJECTIVE:** Complete planning and construction of new buildings to facilitate projected needs.

**STRATEGIES:**

1. Form space planning committees at the department and college level.
2. Develop plan for new research laboratories.
3. Provide additional facilities to accommodate distance education.
4. Plan for acquiring additional land for the new building sites.
5. Develop strategic alliances with NJIT neighbors: Newark campus of Rutgers University, the University of Medicine and Dentistry of New Jersey and Essex County College for the purposes of joint academic and administrative programs.
6. Utilize space opportunities at the University Science Park.
OBJECTIVE: Improve utilization and reprogramming of existing space.

STRATEGIES:
1. Explore the current utilization of existing space, particularly that assigned to principal investigators, in order to reallocate space to higher priorities.
2. Examine existing teaching laboratories to see how effectively they are utilized.
3. Fully utilize the capabilities of a new facilities’ database to improve class and lab space allocation.
4. Re-assign vacated spaces to library, CSLA and CCS.

G. VISIBILITY

GOAL G.1: Raise the visibility and awareness of New Jersey Institute of Technology at the regional, national, and global level.

OBJECTIVE: Brand New Jersey Institute of Technology as an institution of higher education which offers quality academic programs, ongoing continuing professional education, and topical, timely research as well as serves as an engine for economic development.

STRATEGIES:
1. Develop a market-oriented approach to branding the university which includes: conducting research, acting upon the research results, developing a fluid master comprehensive marketing communications plan, developing the key messages, and utilizing the marketing mix to promote NJIT’s image.
2. Improve media coverage of NJIT’s students, faculty, and staff accomplishments and achievements by being a proactive resource for journalists, through the faculty resource guide and by offering subject matter experts on topical issues, increasing the number of press releases written and distributed, developing story lines of interest at the local, regional, national, and global levels, and supporting the NJIT Technology Poll.
3. Utilize opportunities for insertions in the dozens of professional publications representing NJIT’s disciplines.
4. Develop and implement an integrated marketing communications plan that connects to the overall master plan. The plan will be reviewed annually and modified as warranted.
5. Continue to analyze target markets and stream appropriate information and activities to reach targets. Include faculty and members of the academic community as a significant targeted market.
6. Encourage and host various academic and non-academic groups to conduct meetings, tour the campus, and meet appropriate faculty and staff to create a “buzz” about the university and all of the resources it has to offer.
7. Submit applications to compete for more publication awards.
8. Establish a marketing communications homepage for the internal NJIT community that provides information on the master marketing communications plan and sub-plans, a time table for release of
promotional materials, standardized formats for fact sheets and presentations, press releases, NJIT stories that have been placed in the media, the progress of our marketing effort, etc.

**GOAL G.2:** Enhance the national reputation of New Jersey Institute of Technology as a premier public research university.

**OBJECTIVE:** Continue building the image of NJIT as an academic institution of excellence that is student-focused with high academic standards, excellent faculty, and state-of-the-art research centers.

**STRATEGIES:**
1. Develop story lines about the university that have national appeal and relevance. Target dissemination of these stories to the national media, influential business and political leaders, and leadership at other universities.
2. Redesign the NJIT website to reflect the technological excellence of the university by making it user-friendly, appealing, and informative.
3. Expand the advertising of NJIT beyond the New Jersey media channels to increase audience reach and awareness of the university.
4. Host at least one national academic or non-academic conference per year on a subject that has national appeal and is part of the public discourse.

**H. FUND RAISING**

**GOAL H.1:** Continue to increase private fund raising to support ongoing programs and the implementation plans for NJIT’s future through the Office of University Advancement.

**OBJECTIVE:** Continue to increase the university’s endowment to increase scholarship funding and faculty chairs.

**STRATEGY:**
1. Utilize the success of the “The Campaign for NJIT – Design for the Future” as a benchmark and stepping stone to a larger and more ambitious campaign for endowment and scholarship support.
2. University senior administrators increasingly regard fund raising as integral to their responsibilities.

**OBJECTIVE:** Increase alumni giving.

**STRATEGIES:**
1. Continue to personalize the annual appeal to the greatest extent possible; institute professional telemarketing to consistent non-donors; enhance the family campaign through leadership training, person-to-person solicitation, and enhanced direct mail; develop groups of student leaders to strategize and implement a senior class campaign.
2. Continue to strengthen the planned giving marketing program with personal visits by the planned giving officer; follow up on potential donors by fund raising professionals; enhance mailings targeted to age groups with potential for planned gifts; institute enhanced software for up-to-date gift calculations to better serve donors.
3. Encourage further development of Alumni Association chapters. Increase development and realization of alumni events mounted by the Alumni Office so that information and follow-up occurs in a manner that optimizes alumni relations.

OBJECTIVE: More effectively involve the business expertise and encourage fund raising from the Board of Trustees and Board of Overseers. Continue to encourage and support Board members as the premier corporate advisors and the leaders in major fund raising in the community.

STRATEGIES:
1. Establish committees and councils to focus on specific areas of improvement for the university, such as review of the university’s plans and special needs. Members could provide not only expertise, but also corporate resources to implement change, equipment gifts, and in some cases, on-site executive leadership.

2. Provide periodic updates regarding university accomplishments and achievements in between meetings to keep them apprised of and involved in NJIT. Staff in University Advancement will increase reports and updates to Board members so that meetings focus on an active dialogue about key issues. Advancement will also provide staff at sub-committee meetings to assist with follow up and report back to the full Board.

3. Encourage Board members to make recommendations relative to strategic planning to help increase understanding of the financial needs of the university. Board of Trustees and Board of Overseers members encourage private giving through their example, and help gain access to corporate and other support.