MIT SINCE 1999

**A Five-Year Report to the Commission on Institutions of Higher Education,
New England Association of Schools and Colleges**

**Massachusetts Institute of Technology
Cambridge, Massachusetts**

November 2004

TABLE OF CONTENTS

MAJOR CHANGES SINCE 1999

REPORT PREPARATION

The Massachusetts Institute of Technology is pleased to present this fifth-year report to the Commission on Institutions of Higher Education of the New England Association of Schools and Colleges. We welcome the opportunity to review the Institute's progress since its comprehensive evaluation for continued accreditation in 1999. The last five years have seen an outpouring of creativity across MIT, outside as well as inside the classroom and laboratory.

After the required institutional overview, we report in depth on the three areas identified by the Commission for special emphasis: student life and learning, library resources, and physical resources. There follows, as requested by the Commission, a report on the Institute's distance education activities, discussed in the larger context of MIT's initiatives in the use of technology to enhance education. The overview of other major changes since 1999 is focused on organization and governance, programs and instruction, faculty, and financial resources. As requested by the Commission, the report closes with a discussion of efforts of enhance institutional effectiveness, which focuses on the work of the Task Force on the Undergraduate Educational Commons, and a summary appraisal.

This report was prepared under the direction of the Institute's Chancellor, Professor Phillip L. Clay, and its Accreditation Liaison Officer, Kathryn A. Willmore, Vice President and Secretary of the Corporation. The responses to areas identified for special emphasis were developed in conjunction with the cognizant senior officers of MIT: on student life and learning, Larry G. Benedict, Dean for Student Life, and Professor Robert P. Redwine, Dean for Undergraduate Education; on library and information resources, Ann J. Wolpert, Director of the Libraries; and on physical resources, Professor Claude R. Canizares, Associate Provost.

The narrative report was prepared by Michael A. Baenen, Special Assistant in the Office of the President, on the basis of contributions from offices across the Institute, including the Academic Resource Center; the Department of Athletics, Physical Education, and Recreation; the MIT Careers Office; the Office of Community Development and Substance Abuse Programs; the Graduate Students Office; the MIT Libraries; the MIT Medical Department; the Office of the Provost; the Office of the Registrar; the Singapore-MIT Alliance; Student Financial Services; the Division of Student Life, and Student Life Programs; the System Design and Management Program; and the Office of the Dean for Undergraduate Education.

The data forms were prepared by the Institutional Research group in the Office of the Provost with contributions from the Office of Budget and Financial Planning, the Controller's Accounting Office, the Human Resources Department, and the Office of the Registrar.

INSTITUTIONAL OVERVIEW

The mission of MIT is to advance knowledge and educate students in science, technology, and other areas of scholarship that will best serve the nation and the world in the 21st century.

The Institute is committed to generating, disseminating, and preserving knowledge, and to working with others to bring this knowledge to bear on the world's great challenges. MIT is dedicated to providing its students with an education that combines rigorous academic study and the excitement of discovery with the support and intellectual stimulation of a diverse campus community. We seek to develop in each member of the MIT community the ability and passion to work wisely, creatively, and effectively for the betterment of humankind.

* * *

The Massachusetts Institute of Technology is an independent, coeducational, privately endowed research university. The Institute admitted its first students in 1865, four years after the approval of its founding charter. The opening marked the culmination of an extended effort by William Barton Rogers, a distinguished natural scientist, to establish a new kind of independent educational institution relevant to an increasingly industrialized America. Rogers stressed the pragmatic and practicable. He believed that professional competence is best fostered by coupling teaching and research and by focusing attention on real-world problems. Toward this end, he pioneered the development of the teaching laboratory.

Teaching and research—with relevance to the practical world as a guiding principle—continue to be MIT's primary purpose. The Institute is organized into five Schools that contain 27 academic departments, as well as many interdisciplinary programs, laboratories, and centers whose work cuts across traditional departmental boundaries.

In academic year 2003-04, undergraduate enrollment totaled 4,112, of whom 42 percent (1,739) were women. Graduate enrollment totaled 6,228, of whom 29 percent (1,798) were women. Students came from all 50 states, the District of Columbia, four territories, and 106 foreign countries. International students made up 8 percent of the undergraduate population and 36 percent of the graduate population.

Admission to MIT is highly selective at both the undergraduate and graduate levels. Less than 16 percent of those who submitted final applications for the Class of 2008 were offered admission, and 65 percent of those accepted chose to enroll.

Members of the Institute's faculty instruct undergraduate and graduate students, and engage in research. In academic year 2003-04 there were 974 members of the faculty: 598 professors, 184 associate professors, and 192 assistant professors. MIT's teaching staff also includes 449 senior lecturers, lecturers, and professors emeriti; 135 instructors (including technical instructors); 23 adjunct faculty; and 765 teaching assistants and graduate instructors.

The Institute's chief executive officer is the President. The Provost, Chancellor, Executive Vice President, and the Vice President and Secretary of the Corporation report directly to the President. The Associate Provosts, the Deans of MIT's five Schools, and the Director of the

Libraries report to the Provost. The Dean for Undergraduate Education and the Dean for Student Life report to the Chancellor. The Vice President for Research reports to the Provost with regard to major research laboratories and centers and works closely with the Chancellor on matters of graduate education. The Dean for Graduate Students reports jointly to the Chancellor and to the Vice President for Research. The Vice Presidents, who manage the Institute's major administrative divisions, report to the Executive Vice President. The Treasurer reports to the President and the Executive Vice President.

The MIT Faculty determines the Institute's educational policy. The Faculty meets monthly and conducts much of its business through elected standing committees.

The Institute's board of trustees, known as the Corporation, includes approximately 75 distinguished leaders in education, industry, science, engineering and other professions, and (ex officio) the chairman, president, treasurer, and secretary of the Corporation, as well as three representatives of the Commonwealth of Massachusetts. The Corporation also includes approximately 30 emeritus members.

This report deals with the programs of teaching and research based on the Cambridge campus. MIT's Lincoln Laboratory, located in Lexington, Massachusetts, is a federally sponsored center for research and development in advanced electronics, with special emphasis on applications to national defense, worldwide communication, and civil air traffic control.

More information about MIT is available in *MIT Facts 2004*, available at http://web.mit.edu/facts/. The Institute's course catalogue (the *MIT Bulletin*) is at http://web.mit.edu/catalogue/.

STUDENT LIFE AND LEARNING

1999 Evaluation

In the year 2000, the Commission on Institutions of Higher Education asked that this interim report give emphasis to the Institute's continued success in "coordinating efforts by the units responsible for academic programs and student services to further improve the undergraduate experience and the quality of campus life in general."

More particularly, the Commission reported following the 1999 evaluation as follows:

> The Commission applauds the Institute's many productive attempts to improve the quality of campus life, particularly for undergraduates, despite the many challenges posed by the institution's size, urban settings, and extremely demanding academic programs. We were especially gratified to see that the Institute has already taken several steps to address concerns addressed by the visiting team, even as it continues efforts to pursue recommendations of its own Task Force on Student Life and Learning. The Commission is cognizant that a great deal has already been achieved in this area, and that the Institute more than fulfills our standard on Student Services. As the Institute itself recognizes, perhaps even more could be done through closer coordination between the administrative offices that oversee undergraduate education and student life, and by implementing additional strategies for involving graduate students and faculty in campus events. We encourage the Institute to continue its commendable efforts to improve the various facets of student life and thus augment the sense of community on the campus, and look forward to learning of its continued success in the 2004 report.

In the five years since the 1999 evaluation, the Institute has worked to strengthen the undergraduate experience and the quality of campus life along many dimensions—through

policy changes, enhanced funding for programs, increased staff resources, and the cultivation of partnerships across organizational boundaries.

Administrative Reorganization

In January 2000, Professor Rosalind H. Williams announced that she would step down as Dean of Students and Undergraduate Education at the conclusion of her five-year term. Earlier in the academic year, Dean for Student Life Margaret R. Bates, who reported to Dean Williams, had announced that she would leave her position at the end of the academic year.

These leadership transitions offered an opportunity to assess organizational structure after several years marked by rapid change. Effective July 2000, the existing Office of the Dean of Students and Undergraduate Education (ODSUE) was restructured into two new organizations, the Office of the Dean for Undergraduate Education (DUE) and the Office of the Dean for Student Life (now Division of Student Life—DSL). Professor of Physics Robert P. Redwine, director of the Institute's Laboratory for Nuclear Science, was appointed Dean for Undergraduate Education. Larry G. Benedict, previously Dean for Student Affairs at the Homewood (main) campus of The Johns Hopkins University, was named Dean for Student Life. Both Deans report to the Chancellor and sit on the Institute's Academic Council.

As then-Chancellor Lawrence S. Bacow noted at the time, "These changes were made to strengthen both student life and undergraduate education. By pulling the offices apart just a bit, the new dean for undergraduate education can focus on issues of educational policy while the dean for student life can focus on enhancing the co-curricular experience of our students. As a member of Academic Council, the dean for student life will also raise the visibility of student life issues at the highest levels of the administration."

This administrative reorganization has been closely monitored not only by the Chancellor and the President but also by visiting committees of the Corporation. The Visiting Committee for ODSUE met for the last time in March 2000 and endorsed the new structure. New visiting committees were established for DUE and DSL: these committees have one member in common, and to provide continuity each has included members of the former ODSUE visiting committee. Each of the new visiting committees has now met twice, and they have expressed strong support for the new organization. One member of the team that evaluated MIT for continued accreditation in 1999 has become a member of the Visiting Committee for the DSL.

Following the administrative reorganization, the Faculty Policy Committee recommended that the existing Faculty Committee on Student Affairs be re-chartered and renamed the Committee on Student Life. The Faculty approved the re-chartering and the new name in December 2001. The Committee serves as the standing Faculty advisory body to the Dean for Student Life and is concerned with "student life and the quality of the learning and living environment at MIT with specific attention to issues of community." Its voting members include undergraduates and graduate students as well as members of the faculty. During the academic year, the Dean for Student Life meets with the Committee on a bi-weekly basis.

There is close collaboration between DUE and DSL at all levels of the organization. From the start the two Deans have been physically located in a single headquarters suite, and they work closely as team along with the Dean for Graduate Students. These three deans meet regularly with the Chancellor, to whom they report.

MIT has worked to ensure that sufficient resources are available to strengthen the residential and campus community. The Administration has provided the Dean for Student Life with allocations from general Institute funds that, in conjunction with revenues from auxiliary operations, have permitted the addition of new positions within DSL that support student life on campus.

Separately, in academic year 2002-03 MIT introduced an annual fee of $200 to be paid by all graduate and undergraduate students, to be devoted exclusively to enhancing the quality of student life. These additional funds are committed to student groups, activities and organizations, club sports, and the operations of the new Zesiger Sports and Fitness Center.

The largest share of the revenue from the student life fee supports the operation of the Institute's expanded athletic and fitness facilities. In addition, the Dean for Student Life and the Dean for Graduate Students have received a total of $600,000 annually to support activities for both undergraduate and graduate activities. At the undergraduate level, these resources have supported increased funding for the Class Councils, large events, and weekend activities. Funding for activities has been available for fraternities, sororities and independent living groups as well as residence halls and campus groups. The Graduate Students Office has used the funds to support both departmental initiatives and house initiatives to enhance graduate community life.

Current Organization

DUE

The following major offices now report to the Dean for Undergraduate Education:

- Academic Services (including first-year orientation and advising, the January Independent Activities Period, and the Undergraduate Research Opportunities Program)
- Admissions
- Careers Office (including pre-professional advising)
- Edgerton Center (hands-on educational experiences and service learning)
- Minority Education
- Registrar
- ROTC Programs (Army, Navy, and Air Force)
- Student Financial Services
- Teaching and Learning Laboratory (including educational assessment and innovation and consulting services for faculty and graduate students)

The Associate Dean for Undergraduate Education oversees special educational projects and initiatives including the undergraduate student exchange with Cambridge University and the Communication Requirement. A Student Services Information Technology team supports the work of all the areas within DUE and many within DSL.

DSL

The following major offices now report to the Dean for Student Life:

- Department of Athletics, Physical Education, and Recreation
- Community Development and Substance Abuse Program

- Enterprise Services (including Audio-Visual Services, the Campus Activities Complex, Campus Dining, the Copy Technology Centers, the Endicott House conference and special-event facility, and the MIT Card and Tech Cash)
- Housing and Dining Services
- Senior Associate Dean for Student Life (including the Chaplaincy and Counseling and Support Services)
- Student Life Programs (including Fraternities, Sororities, and Independent Living Groups, the Latino Cultural Center, and Lesbian, Bisexual, Gay, and Transgendered at MIT, the Public Service Center, Residential Life Programs, and Student Activities)

A central Administrative Services team serves as a shared services center and supports the work of all the areas within DSL.

We review here major initiatives and activities of the last five years relevant to the Commission's standard on student services. Developments in undergraduate programs and instruction are reviewed in the section below on major institutional changes since the 1999 evaluation.

Orientation for New Students

Working collaboratively, offices in DUE and DSL take a holistic view of the first-year experience.

The Institute has continued to strengthen its undergraduate Orientation programming over the last five years. The requirement that all first-year students live in campus residence halls (discussed below) has allowed Orientation to focus more closely on key academic and community issues. The program now includes new or expanded sessions on academic integrity, alcohol and substance abuse, diversity, health and wellness issues, and rape awareness, as well as more opportunity for informal interaction with faculty. Involving students in planning and implementing programming has been a central goal.

New Orientation programming for parents provides them with a better understanding of the Institute's academic programs and offers guidance on how they can best support their students.

Orientation activities are coordinated by the Academic Resource Center within DUE in close collaboration with other offices in DSL as well as DUE.

Since the 1999 evaluation, the very successful freshman pre-Orientation programs have expanded substantially: five new programs were offered for the first time in 2002. During 2004, more than 40 percent of the incoming Class will participate in a total of ten different weeklong programs. Four of these programs offer introductions to academic departments (Civil and Environmental Engineering, Mechanical Engineering, Nuclear Engineering, and Ocean Engineering), while the others focus on the arts, leadership, the outdoors, and urban community service.

A working group of senior administrators from DSL, DUE, and the MIT Medical Department has been developing a new integrated life-experience curriculum that will take students from Orientation through the remainder of the academic year, helping them develop life skills and leadership ability in the context of residential life and athletic participation.

Residential Life

The last five years have seen tremendous changes in residential life at MIT. In 2002, the existing office of Residential Life and Student Life Programs (RLSLP) was separated into two offices, Housing and Student Life Programs. These offices continue to work closely together, while the new organization reflects operational responsibilities and addresses more clearly the specific needs and expectations of customers—not only students but also the larger Institute community.

Since the 1999 evaluation the Institute has opened three new residence halls: Simmons Hall, accommodating 350 undergraduates; 70 Pacific Street, accommodating 700 graduate students; and 224 Albany Street, accommodating 120 graduate students. With the new facilities, in 2003-04 MIT housed 2190 of its 6228 graduate students.

The opening of Simmons Hall and 70 Pacific Street in fall 2002 coincided with the successful implementation of the new requirement that all first-year students live in campus residence halls—undoubtedly the most important recent development in undergraduate student life at the Institute. Plans for the transition built on substantial community input, and the implementation has been remarkably smooth. Staff in the Academic Resource Center and Student Life Programs have worked closely together to develop programming that supports first-year students and to assess the impact and success of the change in housing policy. First-year students have increasingly expressed their satisfaction with the new arrangements. Before the new requirement took effect, in academic year 2001-02,the Institute surveyed satisfaction within the residence halls in a survey benchmarked to the ACUHO-I/EBI (Association of College and University Housing Officers—International/Educational Benchmarking, Inc.) Resident Survey; staff are now waiting for results from a comparable survey conducted last year. Last year's survey included residents of fraternities, sororities, and independent living groups (FSILGs) as well as of campus residence halls. These and other surveys provide important tools for planning as well as assessment.

MIT remains committed to a diversity of residential experiences, and first-year students live in all of the undergraduate houses: although all now live on campus, there is no "freshman dorm." Incoming first-years request residence assignments in early June. In fall 2003, 87 percent were assigned to their first- or second-choice residence hall. Students unhappy with their assignment may enter an adjustment lottery that is run at the close of Orientation; in fall 2003, 110 students (13 percent of the Class) were reassigned. Permanent room assignments are made following the adjustment lottery through an in-house lottery process overseen by house government, except in McCormick Hall, where students live in their permanent rooms from the start.

The Institute has also made great progress in reducing crowding in the residence halls, deliberately keeping the size of entering classes well below historic levels. Although the yield on offers of admission for the Class of 2008 was unexpectedly high, MIT is working to ensure that the size of the class does not compromise the progress that has been made. The Institute has continued its active program of maintenance and renovation in the residence halls. A feasibility study for new student housing is underway.

MIT is working actively to strengthen faculty engagement with residence life. Outstanding faculty members continue to be attracted to service as housemasters and associate housemasters in both the undergraduate and graduate residences. There has been a concerted effort to

strengthen the esprit de corps of the housemasters as a group and to engage them in planning and assessment of residential initiatives.

The House Fellows program provides an important additional avenue for faculty engagement with the residence halls, creating a relationship between a floor or entry in a residence hall and a member of the faculty or a physician in the Medical Department. The House Fellows Program was created to enrich the student learning and living environment at the Institute through informal faculty-student interaction within the living groups. Each residence hall is allocated a specific number of House Fellow grants based on student occupancy rates; residents select their own fellows. The activities of the House Fellows vary widely depending on their own interests and the cultures of the living group, but all seek to maintain contact with a floor, entry, or house and to contribute to its intellectual and social life, giving students an opportunity to "get to know" at least one member of the faculty outside the classroom or laboratory. House Fellows in McCormick Hall and Next House participate in the Residence-Based Advising programs of those houses, which are discussed below.

Since 2001, a team of professional Residence Life Associates (RLAs) has been working in collaboration with the faculty housemasters and graduate resident tutors within the residence halls. The RLAs offer resources, skills, and energy in areas of crisis response, event planning, activity support, training, and communication between DSL and the residence halls. Each of the five RLAs serves a specific zone of two to three residence halls and lives on-site. The arrival of the RLAs on campus provided an opportunity to redesign the emergency response protocol within the residences. The RLAs serve as staff on call on a rotating basis to provide immediate response and follow-up in the event of student or campus emergencies. They are supported by a team of secondary responders available for consultation and assistance.

The Residence Life Associates work closely with the approximately 80 Graduate Resident Tutors in the residence halls, who have long had close ties with the Medical Department and the Institute's health educators. Relationships with the MIT Campus Police are strong.

The Institute has also moved to strengthen the dining program, as recommended by a review of campus dining undertaken in academic year 2001-02. The goal has been to attract students, faculty, and staff while realizing a community vision and role for dining. The Institute aims to achieve a balance of choices for students between MIT dining facilities, personal cooking, and off-campus dining. The success of the dining program established in the new Simmons Hall has led to its adoption in additional undergraduate residence halls.

Fraternities, Sororities, and Independent Living Groups

The Institute was aware from the start that housing all first-year students in campus residence halls would have major implications for the FSILGs. Living groups faced the loss of revenue from first-year residents and the needed to learn how to attract new members who had already spent time in the residence halls. At the same time, the FSILGs were affected by the changing demographics of the undergraduate population and changing national trends in student residential preferences.

Recognizing these challenges, MIT has provided substantial transitional funding—totaling $1.5 million—and significantly enhanced the staff resources supporting FSILG operations, alumni/ae relations, and activities. Transitional funding was allocated over three years

beginning in academic year 2002-03. In summer 2003, with start-up funding and office space from the Dean for Student Life, the FSILG alumni/ae founded a new independent purchasing cooperative for FSILGs. The cooperative seeks to leverage substantial purchasing power to improve the quality, service, delivery, and cost of goods and services for member houses. It has been successful beyond anyone's expectations. A new grants program, supported through alumni donations, aims to help chapters support capital and operational costs directly associated with the educational aspects of their chapter houses.

The schedule and format of FSILG recruitment activities has evolved in dialogue with student leadership in the residence halls and the FSILGs. Recruitment for fraternities and independent living groups takes place following the conclusion of Orientation, after first-year room assignments in the residence halls have been finalized. A second recruiting period takes place in the spring. Sorority recruitment takes place just before the start of the spring term, following the January Independent Activities Period.

During academic year 2003-04, a Presidential task force including faculty, students, administrators, and alumni examined the current status of the FSILG system and developed recommendations for its future. The Task Force was asked to address, in particular, the following issues:

- The past, present, and potential contributions of the FSILG system, including an assessment from the learning-environment and leadership-development perspectives.
- The range of environments offered to undergraduate students by the FSILG community and how that range serves the overall community.
- Mechanisms by which the FSILGs could meet the recruiting challenges introduced by changes in Institute policy, particularly the housing of first-year students in campus residence halls.
- The possible use of incentives as part of the basis for distributing transition funds.
- The roles of alumni/ae and mechanisms by which MIT could increase the level and effectiveness of alumni/ae involvement.
- The roles of various Institute offices in supporting the FSILGs.
- The role of MIT leadership and relationships between the administration and the FSILG community.
- The facilities, operations, and finances of the FSILGs.
- Relationships with local governmental agencies in Boston, Brookline, and Cambridge, and the possibility of moving additional FSILGs to Cambridge.

The Task Force consulted with students, alumni/ae, house corporation members, the Administration, and other stakeholders to identify the issues and to frame recommendations for strengthening the FSILG system, and then sustaining it for years to come. During summer 2004, the Task Force shared a draft report with key stakeholders while working to further refine its conclusions.

The Task Force found that FSILGs provide a large number of undergraduate students with important resources for community life, social support, and leadership development as well as housing. For generations, they have played these roles, which will be critical in the future as well. While this view is widely held by faculty and administrators, some FSILG alumni/ae and students do not feel fully supported as they face the many challenges of viability and sustainability in an age of rapid demographic, social, and educational change at MIT. This has been exacerbated by difficulties in communications and in coming to a shared understanding about the issues and possible ways to address them. By bringing together students, alumni/ae, and members of the administration in its work, the Task Force has brought the Institute closer to a sense of shared understanding and commitment regarding the goals of the housing system and the role of the FSILGs within it.

The recommendations of the Task Force focus on six areas that are critical to achieving a successful transition for the FSILG system:

- Improving communications and working relations among students, administration and alumni.
- Improving the financial health of the FSILGs and establish quality-of-life and infrastructure standards.
- Developing more effective recruiting practices.
- Developing effective roles and responsibilities for all stakeholders.
- Extending and more effectively manage the transition period.
- Including FSILGs in long-term campus housing planning.

The Task Force recognized that recent actions by the administration, alumni/ae, and students have addressed some of the issues it identified. In addition to increased staff support, significant transition funding, and the new purchasing cooperative and grants program, these efforts have included, for example, alumni-sponsored training for FSILG treasurers during the January Independent Activities Period, ongoing recruitment training; risk management initiatives undertaken by the Interfraternity Council, and the creation of a new position to provide liaison with alumni. The President has asked the Alumni/ae Association, Resource Development, the Department of Facilities, and the Treasurer's Office to move forward to facilitate fundraising for the FSILGs.

While much has been accomplished, more remains to be done. The Task Force emphasized the importance of more clearly defining the roles and responsibilities of the various stakeholders—students, alumni/ae, and administration—in working on the long-term vitality of the FSILG system and of campus housing overall.

The release of the Task Force report in September 2004 was accompanied by public forums offering the broader MIT community an opportunity to discuss the issues. In addition, the report's web site included a web-based comment form encouraging feedback from constituent groups and individuals. Senior Associate Dean for Student Life Stephen D. Immerman, who co-chaired the Task Force, has been charged with the responsibility of overseeing the FSILG staff, gathering and digesting reactions and ideas from the community, and implementing the report's recommendations in collaboration with stakeholders and staff.

Support for a Diverse Student Community

MIT remains committed to student diversity. Women will make up 42 percent of the Class of 2008; members of underrepresented minority groups (African Americans, Native Americans, and Hispanic Americans), 17 percent; Asian Americans, 26 percent; Caucasians, 35 percent; and international students, 7 percent. At the undergraduate level, the Office of Minority Education, reporting to the Dean for Undergraduate Education, plays a leading role in supporting the academic success of students from underrepresented minority groups.

Under the leadership of President Charles M. Vest, the Institute has taken public positions consistent with its belief in the importance of diversity in higher education. As Dr. Vest said in February 2004 at a celebration in honor of the birthday of Dr. Martin Luther King, Jr., "When it comes to admissions, the modest gains that have been made in the last few decades are fragile. In my experience they are largely the result of specific outreach, mentoring, and constant attention to seek out, inspire, and support the best minority students. I have seen nothing in my career that suggests that eliminating targeted efforts will produce anything other than a slowing or a reversal of the gains that we have made." In 2003 MIT filed with the U.S. Supreme Court a brief as a friend of the court in support of the University of Michigan's freedom to include race among factors for admissions. Stanford University, DuPont, IBM, the National Academy of Engineering, the National Academy of Science, and the National Action Council for Minorities in Engineering joined the Institute in signing the brief.

MIT's student population is unusually diverse in its national origins. During academic year 2003-04, 8 percent of undergraduates were international students, and 36 percent of its graduate students. The geopolitical climate and changing government regulations have combined to increase the difficulties international students face in gaining admission to and attending universities in the United States. Believing that the presence of international students and scholars benefits the entire Institute community, MIT has worked assiduously to meet their needs and ensure their full participation in the life of the university. In the public arena, Institute leaders have affirmed that continued openness to international students and scholars is vitally important to American higher education, science and technology, and economic growth.

Through its office of Student Life Programs, the Division of Student Life administers a range of programs to support MIT's lesbian, gay, bisexual, and transgendered students. In October 2003, the Academic Council approved amendments to the Institute's nondiscrimination and harassment policies, which already protected against harassment or discrimination on the basis of sexual orientation, to include gender identity as well. While the proposal brought forward by MIT's LBGT Issues Group acknowledged that concerns for the most part seem to be worked out successfully at the local level, the Institute felt it was important to send a positive message of inclusion.

MIT's nondiscrimination policy acknowledges that Department of Defense policies regarding sexual orientation, which govern ROTC programs, are in conflict with the Institute's nondiscrimination policy. MIT continues to advocate for a change in military policy and will replace the scholarships of any students who lose ROTC financial aid because of this Department of Defense policies and regulations.

Financial Aid

MIT remains committed to its longstanding policies with respect to undergraduate financial aid: admitting both domestic and international students without reference to financial need, awarding all financial aid on the basis of need, and meeting the full need of all admitted students. The number of students qualifying for Institute grant aid has risen in recent years and stands at 55 percent for the Class of 2008.

Decisions with respect to financial aid policy draw heavily on the deliberations of the Faculty Committee on Undergraduate Admissions and Financial Aid, which includes student representatives. In recent years, Committee discussions have focused on the ways in which financial aid policies can contribute to students' academic success and facilitate their participation in the full range of community activities. In accordance with these goals, MIT has implemented a number of changes to financial aid policies over the last few years; their overall effect has been to lessen the financial burden on students receiving financial aid and their families:

- The contribution students are expected to make to the cost of their education (the "self-help" level) has been reduced by more than one-quarter since academic year 1999-2000, dropping from $7600 to $5500. The lower self-help level ensures that undergraduates can participate fully in the academic, extracurricular, and social life of the Institute without carrying an undue burden of term-time work or heavy debt after graduation.

- In summer 2001 MIT joined other leading private universities and colleges in the development of the "Consensus Approach to Need Analysis." This methodology is intended to take into account the complexity of contemporary family finances: it provides protection for moderate-income families whose homes have increased dramatically in value, considers the financial status of two parents or stepparents rather than three or four for the children of divorced or separated parents, and makes allowances for parents not covered in retirement programs. This approach is more family-friendly than the "Institutional Methodology" used by many private institutions.

- Beginning in 2003-04, undergraduates receiving financial aid have had greater flexibility in choosing their student loan and term-time earnings amounts, allowing them to tailor their financial aid packages to their individual need. Students who do not wish to work during the academic year now have the option of taking the full amount of their self-help in loans.

- The Institute has also implemented a differential expectation for students' summer earnings. The new expectation recognizes that students graduating from high school have a shorter working summer than those already in college, and that students' earnings potential typically rises over the course of their college career. The new expectation rises from $1,500 for entering first-years to $2,800 for rising seniors.

These decisions represent a substantial financial commitment on the Institute's part, and in conjunction with the growing number of students qualifying for scholarships they have led to a notable increase in MIT's budget for undergraduate financial aid. In academic year 1999-2000, the Institute awarded a total of $30.9 million in grant aid; in academic year 2004-05, the Institute expects to award $51.7 million in grant aid.

The aggregate debt level of graduating seniors has been declining, with drops in both the number of students borrowing and in average student debt. Lower levels of indebtedness make it easier for graduates to contemplate graduate school or a wider range of career options, including those in public service.

The Office of Student Financial Services works closely with offices across both DUE and DSL and is represented on the Faculty Committee on Academic Performance and the Faculty Committee on Graduate School Programs.

First-Year Advising

Recent initiatives in first-year advising reflect MIT's commitment to an integrated approach to student life and learning. A new Residence-Based Advising (RBA) program was launched in fall 2000 as a collaborative effort of the Academic Resource Center, Student Life Programs, and MIT Medical. Residence-Based Advising combines the two major support networks for first-year students—the freshmen advising system and the residential community. RBA affords first-years living in McCormick Hall and Next House a unique opportunity to connect with their first-year advisor and with other students within their residence.

RBA advisors are a critical link to academics and campus-wide relationships for students in the program. The role of the advisor is to lead a group of first-year students by teaching an advising seminar or advising them in a traditional one-on-one format. In either case, all of the advisees live in the residence; while the advisors themselves are not house residents, each works in tandem with a student in the house who serves as Resident Associate Advisor.

Resident Associate Advisors (RAAs) strengthen the support network for first-year students and enrich the residence hall community. RAAs are active community-builders and peer mentors who can draw upon and connect the house with Residential Life and Student Life Programs, the Academic Resource Center, and the Center for Health Promotion and Wellness in the MIT Medical Department. RBA is set up to support students academically and socially as a collaborative group. Because the relationships that grow within RBA are important to every student, students commit to the program for the entire academic year.

A substantial percentage of first-year students now participate in RBA: together, McCormick Hall (women only) and Next House (coeducational) house between 20 and 25 percent of the incoming Class. While it is possible that RBA may be extended to other residences in the future, its implementation would not be mandated, since its success very much depends on a fit with the ethos in the house. Like the first-year learning communities, it provides an important option for arriving undergraduates in a residential and advising matrix that aims to maximize student choice.

The four first-year learning communities provide students with another alternative to traditional advising. Their programs meet the requirements of first-year core courses and electives while providing distinctive opportunities to make lasting connections with faculty, staff, and older students. New since the 1999 evaluation is Terrascope, which offers participating students the chance to explore basic science and engineering subjects through the study of Planet Earth.

Upperclass Advising

During academic year 2000-01 a subcommittee of the Committee on the Undergraduate Program (CUP) was charged with investigating the broad issue of mentoring undergraduates. Although it recognized numerous ongoing efforts to enhance the quality of teaching at MIT, the subcommittee found substantial (if colloquial) evidence that the Institute was not as attentive to other kinds of mentoring. This conclusion was not new: it corroborated the findings of both the Task Force on Student Life and Learning and the Educational Design Project, an initiative charged by CUP in 1999 to review the first-year experience.

Based on this background and on the work of the mentoring subcommittee, in November 2001 CUP issued a report on *Mentoring Undergraduates at MIT*. The report identified a number of principles that define high-quality faculty mentoring and made recommendations to the Faculty for their consideration and approval. In May 2002 the MIT Faculty endorsed the general spirit of the report and directed CUP and the Committee on Student life to "develop a comprehensive plan for the design and implementation of new undergraduate mentoring guidelines…." These plans are in final draft form and will be reported to the Faculty during fall 2004.

Advising Resources and Student Information

Over the last few years the Office of the Registrar has devoted substantial effort to providing advisors, instructors, academic departments, and students themselves with desktop access to student information. These initiatives, which disperse student information more broadly and effectively across campus, have been carefully developed to meet academic needs while restricting access on a "need-to-know" basis.

These initiatives have included the development of an online advising folder accessible to first-year students and their advisors. This folder incorporates an array of previously dispersed student information, including advanced placement scores and pending credit, math transfer credit, advanced standing exam results, Freshman Essay Evaluation results, Freshman Advising Seminar assignments, HASS-D lottery results, math diagnostic results, and acceptance into certain academic programs. A sample screen is available at http://web.mit.edu/acserv/projects/freshman_folder.html.

Other new online sites have been designed to help students and their advisors navigate through the undergraduate program more effectively. The First Year site (http://web.mit.edu/firstyear/) offers a robust model of on-time delivery of accurate and comprehensive information. The site includes sections for first-year students, their advisors and associate advisors, and transfer students. A new class site is added each December, as the Admissions Office identifies early admits and launches its site for admitted students. The site is updated at least ten times each year to focus on what students, advisors, and associate advisors need to know at that time of the year; students and advisors are alerted by Email when new information goes up on the site.

Following the development and launch of the First Year site, the Office of Academic Services developed the U-Info site (http://web.mit.edu/uinfo/) as an overview of undergraduate academic planning resources, based on input from students and advisors about their needs. The site features comprehensive information on academics, advising and mentoring, research,

opportunities outside the classroom, and careers. At the same time, it serves as a well-organized portal to more specialized MIT websites and online publications.

Today's environment entails more reporting of student information, as with the federal SEVIS system. At the same time, technology has opened new channels for the misuse of information. At the time of the 1999 evaluation, the Institute was completing a comprehensive review of its student information policy, and a revised policy was adopted shortly thereafter. Addressing the precautions that must be taken when using new information technologies, the new policy has facilitated more effective access to student information while providing appropriate safeguards in accordance not only with federal law but also with the Institute's own tradition of respect for student privacy.

The implementation of student information policy, including educational efforts as well as compliance, is now overseen by a Presidential Committee on Student Information Policy, co-chaired by a member of the faculty and the Registrar. The Committee's voting members include undergraduate and graduate students as well as faculty and staff.

Career Development

The mission of the MIT Careers Office (formerly the Office of Career Services and Preprofessional Advising) is two-fold: (i) to advise and assist students at all degree levels about career choice and decision-making, job opportunities, and academic programs and internships that will enhance their qualifications; and (ii) to assist employers and graduate schools wishing to attract Institute students and alumni/ae. The office helps students develop the self-awareness and skill to explore, clarify, and implement good career choices. An increasingly large proportion of its programming is developed collaboratively; partners include not only the Office of Academic Services and individual academic units but also Student Life Programs and the Department of Athletics, Physical Education, and Recreation. In 2003-04, undergraduates accounted for 63 percent of office visits by students; career development services for graduate students are reviewed below in the discussion of the graduate student community.

Getting to know students early and encouraging early self-assessment are crucial to effective career development and preparation. The Careers Office has increasingly sought to engage undergraduates throughout their time at MIT. While senior-year recruitment remains important, the office's outreach begins as early as Campus Preview Weekend, while prospective students are considering whether to accept the Institute's offer of admission, and Orientation. Recent years have seen a great increase in programming for first-year students. The very successful Freshman/Alumni Summer Internship Program (FASIP), now in its seventh year, provides training to first-year students on how to get internships their first summer in college, and how to be successful in them; it offers opportunities in the United States and abroad in which student interns are paired with a mentor, usually an MIT graduate. The office also reaches out to students in their first year through involvement in choice-of-major programming, and several members of the Careers Office staff serve as freshman advisers. In 2003-04, almost one-quarter of office visits were by first-year students.

While connecting with students throughout their undergraduate years, the office has also sought to reach students who had not previously used its services, through outreach in non-traditional venues including the residence halls and FSILGs. Although fewer MIT undergraduates are interested in careers in medicine and law than at other leading private

universities, the Careers Office sponsors strong preprofessional advising programs. The unique Prehealth Advising System has developed out of the recommendations of a review process with substantial faculty participation. Individual premedical candidates work closely with an individual adviser, either a member of the faculty or a practitioner with strong ties to the Institute. Unlike many institutions, MIT does not seek to discourage weaker applicants from applying to medical school, but success rates remain high: last year, 82 percent of the 65 MIT undergraduates who applied to medical school were accepted, as against a national average of 53 percent.

Student Health and Wellness

Over the last several years, the Institute has strengthened support for student health and wellness not only in the MIT Medical Department, which reports to the Vice President for Human Resources, but also in DSL and—critically—across organizational boundaries.

The Institute continues to strengthen the safety net for students, building on the initiatives in the mental health service that followed the release in late 2001 of the report of a special task force on student mental health:

- Increased utilization of walk-in service for urgent matters.
- A more responsive intake system that minimizes waits for appointments. Students can usually be seen within 24 hours of their initial contact.
- Utilization of weekend psychiatric nurse clinicians for on-site off-hour coverage.
- Transitioning to provide more MIT-based services for all students.
- Increased staff resources, including three new full-time positions (one psychiatrist, one psychologist, and one clinical social worker).
- Creation of a new health educator position to focus on issues of stress and coping.
- Development of an integrated approach to the treatment of students with eating disorders and concerns.
- Initiation of three suicide prevention programs focused on undergraduate and graduate students.
- Enhanced education and outreach to all Institute stakeholders.

Treating emotional stress and promoting resilience are high priorities. Recent additions to the mental health staff have addressed both the diversity of the student community and the need for accessibility of services. New protocols assess when students who have been hospitalized for psychiatric reasons are ready to return to campus life.

More generally, the Medical Department has moved to emphasize community-based health care, exemplified by the establishment of the position of Clinical Director for Campus Life (CDCL) in 2002. Reporting jointly to the Dean for Student Life as well the Medical Director of the Medical Department, the CDCL has promoted the following initiatives:

- Reorganization of health education to launch the Center for Health Promotion and Wellness (CHPW) offering workshops, outreach and individual consultation on a broad range of topics including stress and coping, sexual health/relationships, and

chronic disease prevention. The CHPW supports the individual and communal practice of healthful living through evidence-based programming that empowers MIT community members to use the information and skills necessary to adopt and maintain healthy behaviors, attitudes, and lifestyles. CHPW works collaboratively with students, staff, and faculty to create a safe and caring environment committed to the academic, research, and community goals of the Institute. The long-term vision of the Center is to contribute to measurable improvement in the health of the campus community and its members.

- Development of a student-run, state-licensed emergency medical service, reducing the barriers to accessing care at the Medical Department. In 2003-04, students responded to over 500 calls and volunteered more than 10,000 hours.

- Strengthening of MedLINKS, a residence-based peer education program. In 2003-04 students more than doubled their interactions and referrals, resulting in the early identification of several students with concerning health issues.

- Creation of a unique, representative Student Health Advisory Committee to work collaboratively with MIT Medical clinical staff to improve care for students. In 2003-04, working committees convened in Mental Health, Urgent Care, and Health Communications.

- Improved coordination and program planning between the Medical Department and the Department of Athletics, Physical Education, and Recreation; Housing; the Disabilities Office; Counseling and Support Services; Residential Life and Student Life; and the Chaplaincy.

In early 2002, a new Office of Community Development and Substance Abuse Programs (CDSA) was established within DSL. CDSA works to engage all members of the MIT community in a comprehensive and integrated effort to enhance academic, social, and personal development, relying upon research and the application of data to strategic planning and service delivery. The office advocates for a strengthening of a campus culture promoting informed, responsible decision-making and has relied on student involvement in the development, implementation, and evaluation of its initiatives.

This comprehensive program is consistent with the Institute's priorities regarding alcohol and other drugs, which includes reducing the rates of dangerous drinking and the related harms imposed on the individual and community. This strategy applies a multi-layered, integrated, and collaborative approach in addressing the complex contributors to alcohol and other substance abuse by involving all essential constituencies at the Institute—students, alumni/ae, faculty, MIT Medical, Athletics, Campus Police, and staff. These initiatives are implemented, evaluated, and validated or revised according to research in order to (1) understand the student experience and campus climate, (2) develop programs specific to MIT student needs, and (3) evaluate program impact.

The Institute has developed alcohol and other drug prevention initiatives that:

- Meet the critical needs of students, as determined by students, current national research, and MIT-specific research.

- Involve students in every stage of planning, development, and implementation.
- Address the developmental and environmental contributors for AOD abuse.
- Rely upon sound policy and consistent enforcement.

This approach consists of eight components:

- Assessment and program evaluation.
- Screening and brief intervention.
- Campus/community coalitions (including the Massachusetts statewide coalition).
- Policy review, revision, and enforcement.
- Training and consultation with students, faculty, and professional staff.
- Addressing critical transition issues within the first-year student experience.
- Social marketing.
- Provision of frequent alcohol-free activities on campus.

The Screening and Brief Intervention program has proven to be particularly effective in identifying students engaging in dangerous drinking behaviors and moving those students toward self-reflection. A recent assessment of the program showed that, compared to non-participants, those who had participated in voluntary interviews following screening engaged in lower rates of excessive drinking, engaged in fewer high-risk behaviors, experienced fewer academic consequences associated with alcohol consumption, and reported greater reflection upon and concern with their alcohol use. Follow up data noted a 40-percent decrease among SBI participants reporting engaging in frequent binge drinking, while frequent binge drinking increased among non-participants. In 2004, the MIT program received a "Model Program" grant from the U.S. Department of Education—one of three programs nationwide honored as innovative and effective. The award provides the winning programs with funds to improve, further evaluate, and disseminate their program to other institutions of higher education across the country. The award funds will make it possible to expand the reach of the program more broadly across campus. The success of the program owes a great deal to the students who have been actively involved in its development.

Student Activities and Leadership Development

The Institute has substantially enhanced its support for the full range of student activities since the 1999 evaluation, providing increased staff resources and increased funding for student initiatives.

Increased staff resources have allowed the Student Activities Office to work more closely and proactively with individual student organizations as well as the Association of Student Activities and the Undergraduate Association. The office's program coordinators work closely with each of the four undergraduate Class Councils.

The student life fee has provided a major funding increment, much of it directed to initiatives led by student government. The Class Councils saw substantial increases in their budgets. The student life fee also made possible the establishment of the ARCADE Fund ("Assisting

Recurring Cultural And Diversity Events"), which supports recurring events that focus on diversity within the Institute community and encourage faculty, staff, and students to explore cultures represented on the MIT campus. The ARCADE Fund is overseen by the Undergraduate Association and the Graduate Student Council, as is the Large Events Funding, which supports campus-wide events. Students allocate the ARCADE and Large Events funds with advice from the Student Activities Office program coordinators.

The Student Activities Office also works to further individual and organizational development through leadership training opportunities and experiential education. In recent years it has worked to strengthen the leadership capacity within student organizations through training sessions and through the development of an Institute-wide Chancellors' Summit to share goals and ideas among student leaders and key senior staff. The Student Activities Office continues to coordinate the very successful annual LeaderShape Institute at MIT. All of these programs are marked by strong faculty engagement.

A number of the freshman pre-Orientation programs described above have important leadership development components, and engage some 40 percent of the entering Class. Many programs coordinated by the Academic Resource Center provide students with opportunities to develop leadership skills, backed up by substantial training. These opportunities include positions as Orientation leaders, associate advisors, and Residence Associate Advisors.

Athletics

The Department of Athletics, Physical Education, and Recreation (DAPER) plays a vital role in student life and learning through intercollegiate athletics, physical education, club and intramural sports, and health and fitness programming. One-fifth of all undergraduates participate in one of the 41 varsity sports offered, while academic year 2003-04 saw 6,500 enrollments in physical education classes (1.6 per student).

Since the 1999 evaluation, students, faculty, and staff have all benefited from the addition of important new facilities:

- The Albert and Barrie Zesiger Center for Sports and Fitness, which opened in fall 2002, features an Olympic-size pool, a fitness center, a multi-activity court, squash courts, and a sports medicine center.

- The new Ray and Maria Stata Center for Computer, Information, and Intelligence Sciences includes the Wang Fitness Center, which connects to the refurbished Alumni Pool.

Together, these projects place a vastly expanded array of fitness opportunities within easier reach of the entire Institute community. During the Zesiger Center's first year of operation, the number of students activating their MIT Cards for access to athletic, physical education, and recreation facility access increased by 50 percent over the previous year. Member satisfaction has been very high. Zesiger Center operations are funded in part by the required $200 annual fee paid by all undergraduates and graduate students. Students pay no additional fee to use the facilities.

The Zesiger Center quickly became a hub of community activity on the west side of campus, and the Stata Center fitness facilities will undoubtedly have an equivalent impact on the east side of campus. As important as new facilities have been in strengthening community participation, however, equally important has been the excellence of the department's programming, which seeks to fulfill DAPER's mission of "bringing students, faculty, and staff together in educational activities that promote healthy lifestyles, enhance a sense of community, foster growth in leadership and teamwork skills, and encourage the pursuit of excellence."

The department's initiatives reflect the priorities and directions set by a new strategic plan in 2002. A review of the physical education curriculum is set for the coming academic year, in preparation for the Institute review of the undergraduate educational commons. A comprehensive assessment of varsity sports is underway to ensure that the appropriate sports are offered with the right levels of support and participation: ten sports were reviewed in 2003-04, and the expectation is that all sports will be reviewed over a three-year cycle. The department is now reviewing the 2002 strategic plan in light of the rapid change of the last two years. Finally, space planning continues with the ultimate goal of enhancing the playing surfaces on Briggs Fields through the installation of two synthetic turf fields.

Public Service and Community Involvement

Over the last five years, MIT's Public Service Center (PSC), a unit of DSL, has expanded the real-world learning opportunities it provides for students both in the United States and abroad, including new community service programs, fellowships, and grants.

In academic year 2000-01, the PSC formally launched a partnership with the Institute's Edgerton Center to support service learning activities and the MIT IDEAS Competition. Service learning is a teaching method that integrates community service projects into class curricula. In academic year 2003-04, Service Learning at MIT served 150 students in 8 departments, including the mechanical engineering capstone subject. Since 2001, the program has served 550 students working with 44 members of the faculty in 11 different departments. The MIT IDEAS (Innovation•Development• Enterprise•Action•Service) Competition provides an opportunity for students and other members of the Institute community to develop their creative ideas for projects that benefit communities, locally, nationally, or internationally.

Since the 1999 evaluation, the Edgerton Center has moved administratively from the Department of Electrical Engineering and Computer Science into DUE; since 2003 its mission has explicitly included service learning, in recognition of the success of the Service Learning at MIT initiatives. Today, the Center's mission is to provide a resource center for students engaged in hands-on projects, intercollegiate technical competitions, and service learning; to maintain the Institute's expertise in high-speed and scientific photography; and to build ties to the community through an extensive K-12 outreach program.

Discipline

During academic year 2000-01, the existing Office of Student Conflict Resolution and Discipline and the area of Student Conflict Resolution, Mediation, and Discipline within Residential and Student Life Programs were merged into a single office under the leadership of the Senior Associate Dean, with the goal of establishing a more coordinated campus approach to

discipline. At the start of academic year 2002-03, the Institute appointed an experienced student affairs professional to the new post of Associate Dean for Student Discipline, which currently reports directly to the Dean for Student Life.

The reorganized Office of Student Discipline has worked to coordinate activity between the Faculty Committee on Discipline, Dean's Office panels, and the judicial committees of the residence halls, fraternities, sororities, and independent living groups. The office has sought to clarify the mechanisms for reporting and handling misconduct cases and to elucidate MIT's expectations of students, which has included the development of a new comprehensive overview of student roles and responsibilities.

Graduate Student Community

While this report focuses on activities affecting the Institute's undergraduate population, the last five years have also seen an impressive level of activity with respect to graduate student life and learning. MIT has always relied heavily on individual departments and research areas as the central axes along which graduate student experiences are shaped. Nonetheless, under the leadership of the Chancellor and the Dean for Graduate Students, with support from the Provost, attention has increasingly focused on ways in which the Institute can strengthen the experience of all its graduate students. These developments reflect in part the changing expectations of graduate students themselves. Those who enroll at MIT continue to expect faculty, programs, and facilities of the highest quality, but they also want more support to achieve a balance between academic and cocurricular involvement. The current efforts to strengthen graduate student community reflect collaboration between the Institute and its students.

MIT has increased the resources available to the Graduate Students Office (GSO) and the Graduate Student Council (GSC). A portion of the student life fee introduced in 2002-03 was allocated to the Graduate Students Office, allowing the office to expand existing program efforts and to establish new efforts to improve the lives and experiences of graduate students. In order to ensure broad input into the use of these new resources, the funds have been allocated in part through an open request for proposals from the MIT community to enhance the graduate experience. The proposal process has spurred a new and broader dialogue about the nature of community among graduate students and given the GSO an effective mechanism for gathering fresh, creative ideas for graduate life programming.

In addition to facilitating Institute-wide programming and working in close partnership with the Graduate Student Council, the Graduate Students Office works collaboratively with individual academic units to strengthen their local graduate communities. One important vector of activity has been the development of an increasing number of opportunities and organizations to bring together graduate women within departments. These efforts complement the Institute-wide programs offered by the GSO and the Graduate Women's Group. The GSO also works to provide support for graduate students of color through formal programming, assistance to student organizations, and informal contacts.

Initiatives in residential life have brought new social and academic programs to every graduate residence hall. At the same time, there are new efforts by both the GSC and the Administration to foster the sense of community for those graduate students—more than half—who live off-campus.

While activities and programs can do much to build community, MIT is aware that it has a responsibility to meet the practical needs of graduate students as well. During 2003-04, in an effort to ensure that rising health insurance premiums did not adversely affect graduate students, the Institute established new subsidies for the extended student health insurance plan for both single and married graduate students. Graduate students played an important, thoughtful role in the discussions that led to this decision. This was only one of a number of recent instances in which graduate students have participated effectively in the formulation of Institute policy. Graduate students played important roles on the Institute's Mental Health Task Force and the Campus Dining Board and have provided substantive input in the setting of stipend levels and rents for on-campus graduate housing. The MIT Administration seeks constructive engagement and communication with graduate students on the whole range of issues affecting them.

Achieving a healthy balance between a demanding academic program and cocurricular life is especially important for graduate students with families. During 2003-04, the Institute adopted a new childbirth accommodation policy for graduate students. With the adoption of this policy, which guarantees female graduate students up to eight weeks of paid time away their academic or research duties without penalty, MIT assumed a position of national leadership on an issue of vital importance to women graduate students. The Dean for Graduate Students administers the policy, which is supported by funding from the Schools and the Office of the Provost.

Postdoctoral scholars play key roles in the Institute's research mission but have lacked a central support structure. In spring 2003, the Vice President for Research, in cooperation with the Provost, launched a new postdoctoral association. The new association works to provide opportunities for social and scientific interaction as well as professional development among postdoctoral scholars and is also expected to serve as a resource in the development of Institute policies affecting postdoctoral scholars.

In recent years, MIT graduate students have become interested in an increasingly wide range of careers after graduation. At the same time, graduate enrollments have risen. Support for graduate students and postdoctoral scholars has, therefore, been a priority for the MIT Careers Office. Last year, graduate students accounted for 37 percent of student visits to the office and about two-thirds of workshop participants. A new organizational structure established a staff team dedicated to graduate students, more staff are now working on graduate career issues, and graduate career development programming has been enhanced. Expanded programming has benefited from extensive collaboration with the Graduate Students Office and the Graduate Student Council, while staffing has benefited from funding from the Dean for Graduate Students.

LIBRARY AND INFORMATION RESOURCES

1999 Evaluation

The Commission on Institutions of Higher Education asked that this interim report give emphasis to the Institute's continued success in "reviewing and improving library and information resources, with particular emphasis on electronic access."

More particularly, following the 1999 evaluation the Commission reported:

> We are pleased to acknowledge several initiatives designed to correct perceived deficiencies in the library and information resources at the Institute: the recent completion of a Library Strategic Plan; increased coordination between the library and the administrators responsible for information systems; and the development of a digital library. The Commission also notes with favor the Institute's plans to create a central, technologically advanced interdisciplinary library facility. Nevertheless, because the visiting team cited several specific areas that are now potentially inadequate, including digital library resources for graduate students and faculty, the computer infrastructure, and the physical facilities, some of which are less than fully functional, we were heartened to learn that the Institute has begun to respond in a productive way. Its planning now focuses on the renewal of library facilities and support for the acquisition and maintenance of digital resources. This is in keeping with our standard on Library and Information Resources, which declares that "the institution regularly and systematically evaluates the adequacy and utilization of its library and information resources, and uses the results of the data to improve and increase the effectiveness of these services." (7.6). Knowing of the Institute's intention to continue moving forward with its review and improvement of these resources, we anticipate being apprised of its progress in 2004.

Print and Digital Media

During the last five years, the MIT Libraries have devoted substantial attention to support for graduate students and faculty, especially with respect to digital resources. Institutional funding for the Libraries and the collection development and acquisition processes carried out by subject-specialist librarians have made possible notable progress.

The high rate of inflation in the cost of library materials has stretched library budgets across the country. In this difficult environment, the Libraries have benefited from a commitment by the Institute administration to maintain excellence. In particular, the Institute has supported the

Libraries' need to strengthen electronic access to information resources not only through the regular budget process but also through special allocations:

- In four of the five years, the Libraries received a special allocation of $125,000 specifically for the purchase of electronic resources. Two of these were base budget additions; two were one-time allocations.

- In addition, in two of the five years, the Libraries received special allocations of $100,000 to acquire information resources to support new programs at the Institute. While some of this funding was used to purchase print materials, scholarly books, and journals, a significant percentage of it was also used for electronic resources.

The impact of this funding, as well as efforts within the Libraries to shift spending from print to electronic resources, has been dramatic. In 1999 the Libraries offered 115 databases and 800 e-journals to users on the MIT network; in 2004 they offer 360 databases and 18,411 e-journals. These databases and e-journals have been carefully selected to be of use in the Institute's distinctive education and research programs. In 1999, the e-journals provided by the MIT Libraries were primarily those of scholarly societies; since then, the Libraries have acquired electronic access to content from all the major commercial publishers of scientific, technical, and medical journals. In addition, many significant databases that serve the interests of graduate students and faculty have been added, including among others SciFinder Scholar (Chemical Abstracts online), Gmelin Crossfire (inorganic chemistry), Environmental Science and Pollution Management database, CSA Worldwide Political Science database, Information Science Abstracts, and Digital National Security Archives.

Another initiative has greatly enhanced the value and usability of the databases and e-journals to which the Institute subscribes. In 2003, the Libraries staff installed software on its website that facilitates linking directly from an article citation in an online database to the full text of that article in an e-journal, creating a "seamless interface." This provides users with a powerful new way to move among electronic information sources and has been very favorably received by faculty and graduate students.

The special funding allocated for support for new programs has enabled the Libraries to provide appropriate information resources, both print and electronic, for important new Institute initiatives. Substantial funds have been allocated to the support of biotechnology and biomedicine, an area of tremendous expansion in the Institute's research programs. In addition, collections in a diverse range of fields have been enhanced to support growing programs in the humanities and social sciences, management, and the sciences: Asian and Asian-American Studies, biotechnology industry research, comparative media studies, environmental health, geosystems and geobiology, and human rights. In addition, specific funds were created to support research utilizing new information formats—geographic information systems (GIS) and social sciences data sets.

The Libraries remain keenly aware of the complex and shifting relationship between print and digital media. Attention to the increasing need for and availability of electronic resources has not diminished MIT's commitment to maintaining excellent print collections to support the academic and research mission. During the last five years, the Libraries have purchased on average approximately 20,000 monographs a year and maintained an average total of approximately 22,500 serials subscriptions in all media.

Facilities

For several decades, the development of the MIT Libraries was predicated on a decentralized model that collocated library resources with individual Schools or academic units. Today, the expanding digital service environment, the increasingly interdisciplinary nature of research and teaching, and the need for staffing efficiencies all challenge that model. Recent developments and future plans for facilities reflect this changed environment.

A strategic library program and preliminary architectural design have been completed for a management and social sciences library to be part of the new East Campus complex, which will provide new and revitalized facilities for the MIT Sloan School of Management and the Departments of Economics and Political Science. This new facility will replace the existing Dewey Library, providing expanded individual and quiet study space, collaborative study space, research support areas, and space for storage and display of research-level collections. The Dewey Library management team and other Libraries staff have collaborated closely with the project architects and designers; the project is now in the fundraising phase.

During spring 2002, the Faculty Committee on the Library System strongly recommended the development of a new Engineering/Science Library (ESL); the Faculty Policy Committee and the Corporation Visiting Committee on the Libraries subsequently endorsed this recommendation. In response, the Provost formed and charged the ESL Steering Committee, including the Deans of Engineering and Science as well as facilities and library representatives, to oversee the planning process. To complete the plan, the ESL Planning Committee was formed, composed of staff from the Libraries and Facilities. The Planning Committee has held focus groups with faculty, students, and Libraries staff; completed a benchmarking study; and organized a workshop on the future of engineering and science libraries. The Planning Committee has completed its report, which was delivered to the Provost and the Director of Libraries in summer 2004.

A new ESL would greatly strengthen support of interdisciplinary teaching and research, bringing together resources now dispersed between the Barker Engineering Library and the Science Library (housed, with the Humanities Library, in the Hayden Library). This would make possible the expansion of the existing Humanities Library, providing improved user spaces for learning, study, and instruction, and allowing for the much-needed transfer back to campus of monographs currently stored off-site.

While moving ahead with planning for the proposed ESL, MIT continues to make needed investments in the Libraries' facilities. During summer 2000 the Aeronautics and Astronautics Library moved to a new location, designed to be an integral part of the department's new teaching laboratory. The new library occupies only about one-half the square footage of its predecessor, but an innovative design and focus on embedding the Library into the department's CDIO-based curriculum ("Conceive, Design, Implement, Operate") have made the new facility very successful.

In May 2004 the Libraries launched its new Information Intersection on the Stata Center Student Street. Occupying an attractive, small, visible space at the heart of Stata, the Information Intersection provides an inviting, flexible, information-rich space that supports self-service access to online and information resources. It acts as a point of outreach for the Libraries, a collaborative space to further educational, research and community goals, and a quick access

portal to networked resources and services. Future plans provide for experimenting with innovative online services and computing devices in partnership with research groups within the Computer Science and Artificial Intelligence Laboratory.

The Libraries are working to develop spaces that meet the changing needs of students. The renovation of the entrance area to the Hayden Library, completed in 2002, has provided new user spaces, reconfigured the service desk, and revitalized the public computer cluster. The project has provided a secure 24-hour study space and includes two group study facilities—the first ever offered in Hayden. It has also brought together for the first time circulation, reserve, and reference service points, creating a more friendly and obvious service profile and allowing for staffing efficiencies. Visits to Hayden increased by 19 percent in the first year following this successful renovation.

Other recent renovation projects have included a new state-of-the-art facility for the preservation and conservation of library materials, and the introduction of compact shelving in the basement of Hayden Library. Ongoing space planning projects have helped maximize the space available in libraries across the system.

At the end of academic year 2003-04, the collections and staff of the small Schering-Plough Library, which has supported work in the brain and cognitive sciences, were integrated into the Science Library. This move will allow the Science Library to support interdisciplinary work in the neurosciences and the life sciences more effectively while providing for operational efficiencies.

Information Infrastructure

During academic year 2002-03, the Libraries completed implementation of its new library management system. The Ex Libris Aleph integrated system replaced the GEAC Advance system to become the third edition of MIT's "Barton." The new system offers users easier and improved access to both primary and secondary scholarly resources and to information about their own use of library materials.

The development and deployment of new online self-help tools has been a priority. Collaboration with Academic Media Production Services has allowed the libraries to support electronic reserves within Stellar™, the Institute's locally produced course management system; the goal is to expand this functionality to any course management system used at MIT. The Libraries have also developed useful web-based resources such as the Information Navigator and Business Database Advisor to guide students and researchers in discovering quality information. An online Central Help Service has recently been deployed to improve responsiveness and provide consistency to online reference requests. In addition, all of the libraries in the system now offer wireless network access. (The expansion of wireless access across campus has been a high priority for Information Services and Technology. By the end of October 2005, almost all areas of the campus are projected to have complete wireless coverage.)

Instructional Activity

During the last three academic years, the scope and appeal of the Libraries' instructional offerings have increased enormously. Between June 2001 and June 2004, the number of instructional sessions more than doubled, growing from 143 to 313 per year (up 118 percent), as

did attendance, which rose from 2,923 to 6,178 per year (up 111 percent). The renovations in Hayden Library made possible the conversion of the former Reserve Book Room into a new Digital Instruction Resource Center, which has facilitated expanded instructional programming.

Digital Library Research Group

The MIT Libraries are uniquely positioned to help the research library community understand and respond to the opportunities and challenges raised by the rapid deployment of new technologies. During academic year 2002-03, the Libraries established a new Digital Library Research Group, under the leadership of the Associate Director for Technology, to manage an active applied research program in digital library development. The Institute has also joined the Digital Library Federation, a group of major U.S. research libraries who are leading development of digital libraries.

The most visible of the group's projects has been DSpace, a joint development effort with Hewlett-Packard to create an easy-to-use open-source system to serve as a digital repository for scholarly output, including research papers, digital images, multimedia material, datasets, and teaching material. The DSpace repository for materials produced at MIT went live in the fall of 2002 and now holds more than 4000 items from Institute authors.

Project iCampus, the Institute's educational-technology alliance with Microsoft, has recently provided funding for DSpace to implement the infrastructure necessary to archive the course websites developed through the MIT OpenCourseWare initiative, thus creating a synergy between the Institute's two major institutional efforts in digital scholarly publishing. The Digital Library Research Group has also received funding from the Cambridge-MIT Institute for a number of projects building on DSpace work.

More than 100 organizations and institutions have already adopted the DSpace open-source platform; all are encouraged to participate in an active users' federation, so that system architects and developers can share in the design, maintenance, and enhancement of the system. In addition to being used for institutional repositories, DSpace is being put to a variety of other uses, including e-journal publishing, cultural material collection, and electronic records management. The *IEEE Spectrum* has categorized DSpace, a true archival framework geared at long-term preservation, as a technological "Holy Grail"—"a long-standing quest that could fundamentally change something about our lives."

Building on the success of the initial DSpace development project, Hewlett-Packard, through the MIT/H-P alliance, has also funded SIMILE, a three-year project to extend support in DSpace for rich, customized metadata using W3C standards such as RDF and the Semantic Web.

The projects undertaken by the Digital Library Research Group strengthen the digital resources of the MIT Libraries and have helped make the Institute one of the leaders in the creation of the next-generation research library.

Plans for the Future

From academic year 2000 through academic year 2004 the progress of the MIT Libraries was guided by a five-year strategic plan. Anticipating the completion of that plan, during academic year 2003-04 the Libraries initiated a new strategic planning process, building on ideas

generated during a June 2003 strategic planning retreat of the Libraries' senior administrators. That retreat developed an initial framework for discussion that involves building on three core themes:

1. Meeting faculty and student expectations;
2. Managing complex information resources for the benefit of MIT's research and educational programs; and
3. Exercising leadership in organizational structures and service models for the academic research library of the 21st century.

During spring 2004, Libraries leadership met separately with 14 different library departments to begin gathering input on visions of the future. All staff had been sent the report of the June 2003 retreat and its framework for discussion as background. Additionally, selected individuals were invited to meet with all members of the Libraries staff to discuss ideas and emerging issues from outside the library environment; they included the Institute's Chancellor, Vice President for Research and Associate Provost, Dean for Undergraduate Education, and Vice President for Information Services and Technology.

Senior staff held a second strategic planning retreat in late June 2004 to discuss the ideas and issues raised during the spring meetings. Participants in the planning retreat reviewed the current state of the Libraries, assessed core lines of business from the customer perspective, identified potential strategic directions, and discussed strengths and weaknesses of the current organizational structure. A new five-year plan for the Libraries will be completed by fall 2004.

The MIT Libraries are proud of a long tradition of support for outstanding scholarship and teaching. Recognizing that these are complex and challenging times for all academic research libraries, the Institute is committed to maintaining the Libraries' excellence.

PHYSICAL RESOURCES

1999 Evaluation

The Commission on Institutions of Higher Education asked that this interim report give emphasis to the Institute's continued success in "careful planning for the renovation of existing physical facilities in conjunction with new construction to assure their successful integration."

More particularly, following the 1999 evaluation the Commission reported:

> Although the Institute's numerous buildings are extensive in their size and scope, and a number of major construction projects with the potential to transform the campus are in the planning stages, the current facilities present a serious deferred maintenance challenge. The visiting team was surprised to discover, at such a distinguished institution, evidence of neglect and disrepair in several of the older buildings. We recognize that the Institute is well aware of this problem and has given it high priority, having already begun to formulate corrective long-term plans and to allocate the necessary resources to support it. As this renovation will go forward in conjunction with a variety of major new construction projects, we look forward to reviewing, in 2004, the Institute's success in planning for these significant changes in its physical plant and in integrating new facilities with the existing ones.

Campus Transformation

During the last five years the Institute has made great progress on a campus transformation that strengthens teaching and research and supports a more vibrant residential and community experience. Throughout this effort, new construction has been carefully integrated with the renovation of existing facilities.

Several major projects have strengthened residential and community life, including new student residences. The construction of these new facilities followed substantial investments in the residences during the 1990s, including the comprehensive restoration of Baker House and extensive interior and exterior renovations to Senior House. Three major new residence halls have opened since 1999:

- Simmons Hall accommodates 350 undergraduates, faculty housemasters, visiting scholars, and graduate assistants. The 195,000-square-foot project includes a computer cluster, fitness center, photography laboratory, music rooms, roof terraces, and street-level dining.

- The 346,000-square-foot residence at 70 Pacific Street houses 740 students and two housemasters. It features a wide array of community spaces including a large multi-function room, a resource center for computing and communications services, game room, fitness center, lounges, music room, and meeting space, with above- and below-grade parking.

- The new graduate residence at 224 Albany Street, a renovated industrial warehouse dating from 1890, provides 120 single-occupancy suites, each with its own bath and kitchenette. The design gives graduate students the benefits of private living quarters while bringing them into the campus community.

In a short period of time, the new Albert and Barrie Zesiger Sports and Fitness Center has had a catalytic effect on campus community life. The "Z Center" is a leading-edge facility that features an Olympic-class pool, a fitness center, a multi-activity court, squash courts, and a sports medicine center.

Since 1999 MIT has also completed two major academic projects:

- The Ray and Maria Stata Center for Computer, Information, and Intelligence Sciences is a 730,000-square-foot complex that houses the Computer Science and Artificial Intelligence Laboratory (previously in leased space off campus), the Laboratory for Information and Decision Systems, and the Department of Linguistics and Philosophy, providing state-of-the-art research facilities, an auditorium and classrooms, and underground parking. An important part of the program is a wide range of spaces to support campus life, including fitness facilities, a child-care center, and an interior "Student Street" of community services and gathering places. In conjunction with the construction of the Stata Center, the adjacent Alumni Pool (1940) was renovated.

- The comprehensive renovations to the Camille Edouard Dreyfus Building (1967), which houses 132,000 square feet of laboratory space for the Department of Chemistry, won the 2004 Renovated Lab of the Year Award from *R&D Magazine*—the top national award in this field. The renovation gave the building a more open plan and increased natural light to the laboratories while providing state-of-the-art research facilities.

Currently under construction, with completion expected in 2005, is the brain and cognitive sciences project, which will house facilities for the Department of Brain and Cognitive Sciences, the McGovern Institute for Brain Research, and the Picower Center for Learning and Memory. The 410,000-square-foot project will include state-of-the-art wet and dry laboratories, teaching facilities, a conference center, research and administrative offices, clinical space, and student lounges. An atrium will connect the three groups. Space made available by moves into the project will allow the Institute to address short- and long-term needs in a number of academic and research areas including the Center for Cancer Research, the departments of Chemical Engineering and Earth, Atmospheric, and Planetary Sciences, and the Program in Health Sciences and Technology. The adjacent Parsons Laboratory (Building 48) was renovated in advance of the construction of the brain and cognitive sciences project.

The Institute has continued a long-term project of classroom renovations. Older classrooms are being updated while newly created distance learning classrooms are being designed to include state-of-the-art A/V systems and computer workstations. A number of undergraduate teaching

laboratories in the School of Engineering have been renovated to accommodate new fields of study.

The next major academic projects in MIT's capital plan are the East Campus project and an expansion of the facilities for Media Arts and Sciences. The East Campus project is a multi-phased 450,000-square-foot project that will incorporate facilities for the MIT Sloan School of Management, the Department of Economics, and Dewey Library. The Media Arts and Sciences project will link to the existing Wiesner Building (1985), which houses the Media Laboratory and the List Visual Arts Center, and will be dedicated to the study of information and learning technologies.

Planning Process

Budgeting for new construction and renovation takes place at three levels. Projects costing a total of less than $10 million, with a time horizon of one to three years, are approved and managed by the Committee for Review of Space Planning, chaired by the Associate Provost, as space change projects.

Mid-scale projects, costing between $10 and $50 million, with a time horizon of three to five years, are planned and proposed by CRSP and approved by the Institute's Building Committee, chaired by the Executive Vice President, as capital projects. Decisions are based on enterprise models and capital planning.

Large-scale projects, costing more than $50 million and having a time horizon of five years or more, are planned and proposed by CRSP and/or the Building Committee. They are approved by the Building Committee as capital projects on the basis of enterprise models and capital planning.

Deferred Maintenance

MIT's campus has developed through a relatively small number of periods of intense construction activity, beginning with the move to Cambridge during the second decade of the twentieth century. In recent years, both renovations (discussed above) and demolition in preparation for new construction and have addressed many significant deferred-maintenance challenges. Construction of the new Stata Center entailed the demolition in 1998 of the former Building 20, constructed as a temporary facility in World War II; in 2003 the aging and unsightly East Garage (Building 70), adjacent to the Stata Center, was demolished. A number of smaller obsolete structures have also been torn down on campus, including Buildings E10 and E20, on the site of the future expansion of the Media Laboratory, and 45, on the site of the brain and cognitive sciences project.

Facilities condition is a key decision criterion. In 1998, the Department of Facilities conducted a comprehensive assessment of the condition of campus facilities; that assessment is now being updated to provide a baseline for decision-making. An updated facilities-condition assessment will also make it possible to develop a more accurate estimate of the steady-state spending needed to maintain the campus.

During the last five fiscal years, projects funded by the Committee for Review of Space Planning have totaled $168 million, an average of $34 million per year (including departmental matching

funds). These projects are primarily renovation-driven; the portion of the CRSP budget dedicated to base building renewal is relatively small, but the goal is to address deferred maintenance within a programmatic framework wherever possible. The Institute is working to increase the proportion of such projects paid for with funds raised by departments in order to leverage the Institute's own investment.

Additionally, during the three fiscal years 2000, 2001, and 2002, MIT invested an additional $45 million to substantially address a backlog of deferred maintenance issues.

While new construction, renovation, and selective demolition have brought up the average level of the Institute's facilities, the Institute is aware that modernization of the campus must remain an ongoing priority. During 2003, Payette Associates and Venturi, Scott Brown and Associates, Inc., undertook a comprehensive assessment of the "Main Group," the interconnected academic and administrative buildings at the heart of the campus. That study is informing the development of plans to ensure that these beautiful and historic structures remain vital and functional as they approach one hundred years of use.

Payette Associates has designed a project that will begin implementing a 21st-century vision for the Main Group with a comprehensive modernization of the spaces in Buildings 4, 6, 6A, and 8 occupied by the Department of Materials Science and Engineering, the Department of Physics, and the Spectroscopy Laboratory. It will consolidate and renovate spaces for Physics including the department headquarters, offices for theory faculty, and teaching laboratories; partially consolidate Materials Science and Engineering in renovated spaces; and renovate space for the Spectroscopy Laboratory. A new 50,000-square-foot infill building in the courtyard between buildings 4, 6, and 8 will provide approximately 5,000 square feet of low-vibration laboratory space available for multiple uses. The project will incorporate major infrastructure improvements (HVAC, tel/data, fire safety) serving approximately 20 percent of the Main Group. It will be funded by a combination of gifts, multi-year support from the Committee for Review of Space Planning, and MIT capital investment. This project is intended to serve as a model for future work throughout the Main Group.

The Committee for Review of Space Planning is now undertaking a major review of departmental classrooms and teaching laboratories. The Registrar currently controls 142,000 net assignable square feet of classroom space; individual Schools and academic units control another 67,000 net assignable square feet of classroom space, as well as 89,500 net assignable square feet in teaching laboratories. The goal of the current review is to assure efficient utilization of classrooms consistent with departmental and School priorities and to develop plans to optimize use where possible.

Over the last five years, the Institute has devoted a tremendous amount of attention, and significant Institute resources, to the renewal and reinvigoration of its campus. With the opening of the Stata Center, approximately 25 percent of the campus has been built since 1990. While important deferred-maintenance challenges remain, notably in renewing the historic fabric of the Main Group, we expect to maintain the momentum that is developing physical facilities appropriate to the excellence of our programs of teaching and research.

DISTANCE EDUCATION

Educational Technology and Distance Education at MIT
System Design and Management
Singapore-MIT Alliance

In this section we review the work of the System Design and Management Program (SDM), the only MIT degree program more than one-half of whose credits may currently be earned at a distance, and the Singapore-MIT Alliance (SMA), a pioneering international partnership in education, after discussing the larger context of MIT's activities in educational technology. We review the work of SDM and SMA separately, beginning in each case with the descriptive information requested by the Commission on Institutions of Higher Education of the New England Association of Schools and Colleges.

Educational Technology and Distance Education at MIT

In his annual report for the academic year 2000-01, MIT President Charles M. Vest suggested that, "every institution—new and old—must make some choices about the tactical and strategic role it will play in the digital age. There is not one grand solution. Indeed, I believe that it is too early to declare comprehensive positions and strategies. Rather, it is a time for substantial experimentation and calculated risks that will help us sort out opportunities and find effective paths." Such an approach, with the advancement of learning as its goal, is the path the Institute has been following.

MIT has sought to use educational technology to strengthen education on campus and to leverage its role as a world leader in its chosen fields of study but has not sought to develop a mass-market distance-education enterprise. Institute-wide initiatives have focused on the role of technology in undergraduate education on campus, the development of new educational technologies, and providing broad access to course content developed at MIT. Project iCampus, for example, the Institute's alliance with Microsoft Research, develops new uses of information technology to enhance university education. The MIT OpenCourseWare initiative takes advantage of the democratic possibility of the World Wide Web to offer open access to the universe of the Institute's undergraduate and graduate instructional materials.

MIT has been a leader in the innovative use of information technology to support and advance education for more than two decades, since the launch of Project Athena in 1983. Today, the Institute continues to pioneer the use of educational technologies. MIT has launched a small number of distance-education programs in graduate and professional education. These programs in the School of Engineering and the Sloan School of Management build on existing Institute strengths to reach new constituencies and model innovative approaches to the use of technology in education. They rely primarily on synchronous rather than asynchronous delivery techniques and involve periods of residence on the MIT campus as well as instruction at a distance. The *Rules and Regulations* of the MIT Faculty require a minimum of one semester of residency on campus for any program leading to an MIT master's degree, and at least two semesters for a doctorate.

These distance-education programs are complemented by a wide array of activities designed to enhance the educational experience traditionally provided by a residential, research-intensive university, and to make the course materials essential to higher education more widely available.

An Institute-wide Council on Educational Technology (http://web.mit.edu/cet/) advises the senior administration on the structure and implementation of Institute-wide initiatives and on the distribution of resources for educational experiments and programs. Funds for these initiatives come from within MIT and from externally generated grants, gifts, and collaborations. The Council is involved in discussions between the Institute and potential collaborators concerning initiatives in educational technology and makes recommendations to the senior administration based on these discussions. The Council also monitors the effectiveness of MIT's own programs and experiments in educational technology through the MIT Teaching and Learning Lab.

Educational innovation at the Institute has benefited from visionary philanthropy and forward-looking research sponsors. One particularly important institutional initiative has been Project iCampus (http://icampus.mit.edu/), a five-year, $25-million alliance with Microsoft Research. Project iCampus was established to create and demonstrate technologies that produce evolutionary and revolutionary IT-enabled teaching models and improved educational tools for higher education.

The launch of iCampus in October 1999 followed by just a few months the announcement that MIT graduates Alex and Brit d'Arbeloff had given the Institute $10 million to establish the Alex and Brit d'Arbeloff Fund for Excellence in MIT Education (http://web.mit.edu/cet/init/darbeloff.html), which supports innovations in teaching, with a particular emphasis on the first-year undergraduate experience. Grants from the fund are awarded by a subcommittee of the Council on Educational Technology, in consultation with the Committee on the Undergraduate Program.

The Institute continues to strengthen its infrastructure to support educational experimentation and research and to develop innovative technology solutions for educational use. Academic Media Production Services (AMPS—http://web.mit.edu/ amps/) provides professional, high quality, cost-effective services in support of MIT's educational technology initiatives. AMPS offers a complete set of multimedia, Web, video, and teleconferencing technology services. The Institute has developed and deploys two major learning management systems, Stellar ™ (http://stellar.mit.edu) and SloanSpace. To archive digital content, the MIT Libraries have established DSpace (http://libraries.mit.edu/dspace-mit/index.html), a joint development effort with Hewlett-Packard to create an easy-to-use open-source system to serve as a repository for scholarly output, including research papers, digital images, multimedia material, datasets, and teaching material.

Today we see a groundswell of educational innovation across the Institute, especially at the undergraduate level. Much of this activity focuses on the development and implementation of new active-learning and project-based curricula. Not all of these initiatives rely on new educational technologies, but many do. An important experiment is transforming the two introductory courses in physics required of all undergraduates into studio-style classes in a highly collaborative, hands-on environment, with extensive use of networked laptops and desktop experiments. The innovative iLabs, pioneered in the Department of Electrical

Engineering and Computer Science, provide students in engineering disciplines online access to a remote laboratory. "Bringing the laboratory to the student" in this way has proven to be a great way for students to explore theory versus experiment as they study.

MIT has also partnered with other institutions and organizations in major initiatives designed to model the expansive possibilities of educational technology—its ability to break down institutional and geographic barriers. The Singapore-MIT Alliance, discussed below, is an especially important example.

Perhaps the boldest of the Institute's initiatives in educational technology is MIT OpenCourseWare (MIT OCW—http://ocw.mit.edu/index.html). A large-scale, Web-based electronic publishing initiative funded jointly by the William and Flora Hewlett Foundation, the Andrew W. Mellon Foundation, and MIT, MIT OCW will make the course materials that are used in the teaching of almost all of the Institute's undergraduate and graduate subjects available on the Web, free of charge, to any user anywhere in the world. Materials from more than 700 of MIT's approximately 2,000 courses are already available online through MIT OCW. MIT OpenCourseWare continues the tradition at the Institute, and in American higher education more broadly, of open dissemination of educational materials, philosophy, and modes of thought. MIT anticipates that MIT OCW will help lead to fundamental changes in the way colleges and universities utilize the Web as a vehicle for education. At the same time, it will strengthen instruction on campus in Cambridge.

MIT OpenCourseWare differs from other institutional Web-based education offerings in that it is free and open, because of its depth and breadth, and because it takes an institutional approach to online course publication. MIT OCW is not a distance-learning initiative. Distance learning involves the active exchange of information between faculty and students, with the goal of obtaining some credential. Increasingly, distance learning is also limited to those willing and able to pay for materials or course delivery. MIT OCW is not meant to replace degree-granting higher education or for-credit courses. Rather, the goal is to provide the content that supports an education. Many individual faculty members at MIT and other universities already use the Web extensively to make standard course materials available to their students. Some colleges and universities now require a Web site for every class. But, to a large extent, such Web sites are designed for, and access is only provided to, the students enrolled at these institutions. MIT OCW is an unprecedented institutional effort of a much broader magnitude, as the goal is to provide the course materials free and open to the world. Nothing of this scale has ever been attempted before.

In deploying new educational technologies, MIT's priority has been to enhance the quality of the Institute's teaching and research. Going forward, we will continue to maintain that focus. To do so successfully, we must have a shared vision of appropriate directions, understand our infrastructure needs, and evaluate carefully those initiatives already underway. And we will have to work to ensure the sustainability of those initiatives where relatively modest MIT resources are leveraged with external funding.

To those ends, the Council on Educational Technology is currently engaged in reviewing the educational technology landscape at MIT and developing a recommended list of priorities. This assessment will inform the development of priorities for the Institute's Academic Computing department, fundraising, and institutional budgeting for coming fiscal years.

The remainder of this section reviews in more detail the MIT's two major distance-education programs, the master's program in System Design and Management and the Singapore-MIT Alliance.

System Design and Management

The only MIT degree program more than one-half of whose credits may currently be earned at a distance is the System Design and Management (SDM) program. A joint program of Engineering and Sloan, SDM is aimed at mid-career professionals and leads to a Master of Science in Engineering and Management. It is offered in both on-campus and distance-education modes; the distance-education option includes one semester of coursework on campus.

Descriptive Information

Academic Leadership

Professors Thomas J. Allen and David Simchi-Levi, Faculty Co-Directors, Leaders for Manufacturing and System Design and Management Programs.

Report Contact

Mr. Patrick Hale, Senior Lecturer and Director of the SDM Fellows Program, MIT Room E40-329, 77 Massachusetts Avenue, Cambridge, MA 02139; phone: (617) 253-9668; Email: pat_hale@mit.edu.

Web Resources

Information about distance learning activities within SDM can be found at the SDM website (http://sdm.mit.edu) by clicking on "Academic Program," then "Distance Learning." This is general information on the program for candidates for admission to the program, rather than links to on-line class information for faculty and students. Once students are admitted to the program and registered for classes they are provided with the necessary information to allow them to participate in classes via the videoconference. The point of contact for the course connection information is the SDM Distance Learning Coordinator.

SDM is not an online distance-learning program. Students currently participate in courses from locations other than MIT using live two-way interactive videoconferencing. Specialized MIT classrooms equipped with videoconferencing capability are used for these courses, and classes are taught to both on-campus and distance students simultaneously, during normal class times. The only online component used for delivery of any course-related materials is the same as that used for on-campus students, a web-based virtual community developed by Sloan and known as "SloanSpace." SloanSpace fully integrates learning management with collaboration support for online communities and is based on dotLRN, an MIT-designed open-source course management system. The SDM content on SloanSpace relates only to specific course content and does not include content related to distance learning as practiced by SDM.

Technological Infrastructure

Connectivity for SDM videoconferencing of classes is provided by an internal videoconferencing "bridge" run by Academic Media Production Services (AMPS), the MIT educational technology service provider. Videoconferencing distance sites (other than MIT), located in workplaces or homes, dial in to the "video-bridge" and are connected to the MIT classroom.

Only sites that have been pre-certified by AMPS and are acknowledged to be participating in SDM-related distance courses are allowed access to the bridge. There are two methods these sites can use to connect:

1. Videoconferencing equipment connected through Integrated Services Digital Network (ISDN- H.320 protocol) phone lines (POTS).
2. Desktop videoconferencing equipment that is connected over the Internet (IP based-H.323 protocol, LAN/WAN network). Connection speeds between 128 kbps (minimal) and 384 kbps (optimal) may be used.

A help desk is manned by AMPS one hour prior to and during all videoconferenced classes, and is reachable through phone and AOL Instant Messaging (AIM) at those times. William Foley, SDM Distance Coordinator, and the AMPS Video-bridge technician is available through email, phone, or IM to help facilitate site certification, testing of equipment, and troubleshooting of issues both during and outside of class times (normal work day).

Consortial Partners

The industry-academic partnership is critical to the success of SDM and its partner program, Leaders for Manufacturing (LFM). Industry partners are therefore important members of the LFM-SDM community, participating actively in LFM-SDM governance, the admissions process, internships, faculty research, thesis development, and other initiatives. The benefits for industry partners include sponsoring students, hiring program graduates and developing a cadre of LFM and SDM alumni/ae over the years, access to MIT faculty and research, and company-to-company networking. More than 20 organizations in a wide range of business sectors are currently industry partners with LFM-SDM; a list is available at (http://lfmsdm.mit.edu/partners/partner.html).

SDM has an agreement with AMPS to provide operation of the bridge, which in turn has agreements with ACCORD (Polycom) the video-bridge manufacturer, EXPEDITE (bridge integration and maintenance), and Verizon (ISDN network/phone lines).

Overview

One of MIT's early entries into the field of distance education, the System Design and Management program remains the only degree-granting program at the Institute that can be earned primarily from a remote location. SDM is a joint offering of Engineering and Sloan and leads to a Master of Science degree in engineering and management. The mission of SDM is to educate future technical leaders in architecture, engineering, and designing complex products and systems, preparing them for careers as the technically grounded senior managers of their enterprises. SDM intends to set the standards for delivering career-compatible professional education using advanced information and communication technologies.

SDM was developed in collaboration with industry partners who wanted to provide a graduate education to further the development of their rising engineering leadership. The educational focus is on the engineering and management theory and practice that provide the foundation for the development of complex products and systems. Because prospective students were in their mid-thirties with organizational and family roots in the community, they were not generally able to enroll in a full-time residential program at MIT. Accordingly, the Institute and its industry partners developed a career-compatible version of the SDM program that took MIT to the students, allowing them to pursue a degree without interrupting their careers and

relocating themselves and their families. From the start the distance option has been offered in tandem with an on-campus program.

The MIT Faculty approved the establishment of the SDM program in November 1995 following intensive discussions between Engineering, Sloan, and industry representatives that began in fall 1993. The first draft program proposal, issued in August 1994, was refined through consultation within and outside the Institute; the final proposal was endorsed by the Committee on Graduate Student Policy and the Faculty Policy Committee before its approval by the full Faculty. Eleven students participated in a pilot program leading to an unspecified Master of Science degree, beginning in the academic year 1995-96. The first cohort of students in the new SDM program matriculated in January 1997.

The SDM program centers on a 13-course curriculum in systems, engineering, and management, including a project-based thesis. There are three curricular options: a 13-month in-residence format; a 24-month distance-education format for company-sponsored students, requiring one academic semester in residence at MIT; and a 24-month on-campus "commuter" program option for self-supporting or company-sponsored students. (The last option is similar to the distance program, but students come to campus for classes rather than participating via videoconference.)

Distance and On-Campus Learning

SDM's distance-learning option has been reserved for students sponsored by their employer company or organization. It was designed to blend the best of on-campus and distance education, offering geographically dispersed students a program that maintains the integrity, high academic standards, and individual engagement of the Institute's traditional in-residence programs. The distance option relies on the multi-point synchronous videoconferencing of live classes at MIT, ensuring that the distance students are virtually present in the classroom through the two-way voice and video link. All students take the same classes, so there are SDM students in the same live classes on campus with the distance students who are virtually present.

As with other cohort-based programs at MIT, such as the MBA and the Sloan Fellows Program in Innovation and Leadership, and unlike typical distance-education programs, it was important for students to build strong relationships with the fellow members of their cohort. In the first month of the program, all incoming SDM students, including those taking the distance-learning option, come to campus to participate in an intensive series of classes. This January session is designed to build a strong cohort that will support the long-distance collaboration needed for subsequent class projects undertaken by teams consisting of both on-campus and distance-learning students.

The distance-learning curriculum incorporates several additional periods in residence at MIT, requiring each student to spend one semester and five three-to-five-day business trips on-campus during the 24-month period. The remainder of the program takes place off-campus and includes an international business trip during the second year.

Distance-education classes are predominantly live broadcasts of MIT courses to company sites using multi-point videoconferencing, supplemented by regular, live, interactive videoconference discussion sessions and/or taped/Web-based information. Course instructors are able to engage both remote students and live students in a discussion of the subject material

and readily integrate remote students into the classroom setting. Course administration is conducted via the Web (including submission of class/group assignments).

Governance

SDM is administered through the Engineering Systems Division within the School of Engineering, with faculty co-directors from the School of Engineering and the Sloan School of Management. The current co-directors are Thomas J. Allen (Sloan) and David Simchi-Levi (Civil and Environmental Engineering and Engineering Systems). SDM shares administrative staff with its partner program, Leaders for Manufacturing (LFM), a two-year campus-based program in which students earn both an MBA or a Master of Science from Sloan and a Master of Science from Engineering. While SDM is concerned with the front end of the developmental process, LFM is concerned with the back end, focusing on manufacturing and new product delivery.

Partner companies play a critical role in educating leaders for the total enterprise. They participate in program governance, overall program policy and operations, internships, research, and creating and sustaining a community that extends beyond the boundaries of traditional academic programs.

SDM is overseen by a Governing Board that includes the Dean of the School of Engineering, the Dean of the Sloan School, and senior vice presidents or their equivalents from partner organizations. The Governing Board focuses on the strategic issues associated with the program and the partnerships. Over the last few years the Governing Board has been meeting semi-annually.

The SDM Operating Committee includes the faculty co-directors, the director of the Engineering Systems Division, senior representatives from organizational partners, alumni, students, and staff. Focusing on more tactical partnership and program issues, the Operating Committee meets three times per year, including a two-day summer workshop focused on key issues. This summer's workshop focused on revisiting the mission and long-range vision for the program and developing near-term and long-terms goals and objectives and near-term tasks to meet them.

Since its inception, the SDM program has actively sought student input through the SDM Student Council. The Student Council meets weekly through telephone conferences including first- and second-year students in both the on-campus and distance programs, the SDM director of fellows, and program staff members. Additionally, SDM has formed a number of student led committees to provide real-time leadership opportunities while addressing tactical and strategic aspects of the program. These have included the SDM Curriculum Committee, the SDM Business Trip Committee, the SDM January Program Committee, and the SDM Leadership Committee.

Faculty

SDM draws faculty from throughout the Institute, making it a truly interdisciplinary program. Contributors to the program come from a number of academic units within Engineering — Aeronautics and Astronautics, Chemical Engineering, Civil and Environmental Engineering, Electrical Engineering and Computer Science, Engineering Systems, Materials Science and Engineering, Mechanical Engineering, Ocean Engineering and Nuclear Engineering — as well as Sloan. Many hold dual or joint faculty appointments within MIT's Engineering Systems Division.

SDM also maintains close links with a number of the Institute's interdisciplinary research centers, including the Center for Information Systems Research and the Center for Technology, Policy, and Industrial Development.

Students

The SDM curriculum is designed for professional engineers with at least three years of experience; on average, matriculating students have had nine years of work experience.

Since January 1997, a total of 328 students have enrolled in SDM. More than two-thirds (221, or 67 percent) were employer-sponsored. A total of 227 students (69 percent of the total) were in the distance-learning option. In the most recent cohort, which entered in January 2004, 11 out of 37 students enrolled in the distance-learning option. Since the inception of the program, there have been 262 graduates, 76 percent of them (199) enrolled in the distance option.

The student success rate has been very high, especially in the distance option: only nine students have failed to complete the program, and only one of these, who completed all his course work but not his thesis, was in the distance program. The distance-learning completion rate is 99.5 percent. Of those on-campus students who did not finish, two dropped out within the first two weeks of the program, two transferred to the Management of Technology (MOT) program and were awarded MOT degrees, and four dropped out at various times in the program, one for academic reasons and three because of financial or job conflicts.

Upon the matriculation of the new cohort each January, new students are interviewed about their personal goals and expectations for the program. When students complete the program, they are asked how well the program met their needs and about their expectations for future engagement as alumni/ae.

Employer-sponsored SDM graduates return to their organizations, many building on their SDM education to move into more senior positions either while enrolled or following their graduation. Placement services are offered to all non-sponsored SDM students.

A major theme of SDM is that learning is a life-time endeavor, and as a result the program has developed a strong alumni/ae network; an alumni council; an annual technical conferences that draws up to 25 percent of program alumni; and interactive web-based seminars led by faculty or industry experts that provide opportunities for graduates to stay current on key topics.

Academic Program

The SDM academic program consists of the following:

- Coursework: Thirteen courses—three core, six foundation, and four electives. Core and foundation courses, as well as many electives, are taught on-campus and transmitted live to distance students.
- The January Program: A one-month, in-residence session required of all entering SDM students.
- Business trips to the MIT campus: Five one-week trips where students participate in classes, seminars, workshops, plant tours, and other activities.
- International business trip: A 10-to-14-day visit to global enterprises outside of the United States.

- One full term in residence at the Institute: Required for all 24-month distance-learning students.
- Research and project-oriented thesis.

SDM students begin their academic program with an intellectually rich one-month on-campus session. During this rigorous, academically challenging time, students build a learning community that continuously and constructively challenges conventional leadership models while the individuals support each other in expanding beyond their geographical, professional, and personal limitations. The January Program activities consist of intensive coursework; two design challenges in which students work in multi-disciplinary, cross-industry teams; leadership modules; and cohort-building experiences. The relationships established during this session form the foundation that students build upon as they work together on class projects in globally dispersed teams.

Distance students return to the MIT campus once each term to participate in SDM "business trips," which are designed to impact the working professional's schedule about as much as a working business trip. Designed around a particular topic or theme, these return visits to the Institute pick up where the four-week January Program leaves off. Coming back to campus enables students to renew relationships and engage in networking opportunities, thus adding an important dimension to the educational experience. Business trips enrich the SDM curriculum by allowing students to immerse themselves in a subject over a period of several days through lectures, seminars, workshops, and other hands-on activities conducted by industry experts and MIT professors.

The international business trip is a 10-to-14-day visit to several world-class organizations. It provides students the opportunity to learn about cutting-edge system design and new product development practices, thus enabling them to acquire or enhance a global perspective.

SDM is committed to an education in which students receive broad perspectives on the issues of product development and large-scale systems. An important part of the SDM experience includes site visits to companies where product development experts share their experiences. These tours, scheduled during business trips to MIT, are an excellent way for students to experience firsthand how diverse companies involved in product development and complex systems approach their business.

Because it integrates research in engineering and management issues and results in a product that reflects SDM's unique partnership of students, faculty, and industry, the thesis is a hallmark of the program. Early in the program, students begin to identify systems issues that might be suitable thesis research topics. SDM faculty members help direct the project identification process by communicating extensively with company representatives at all levels to determine significant challenges. Based on thesis topic suitability, students identify faculty advisors. While the study topic is a 6-to-12-month project for students, it often represents a continuum for the faculty and company colleagues who guide the work. Students draw upon past SDM projects as well as the collaborative relationships that faculty have established with company experts. During their thesis research, students must effectively use their time at their work site and on campus to address very real, significant industry needs and achieve substantial results. They typically have opportunities to meet with a broad range of company employees, including upper management, to learn about and further understand how their

company works and expand their knowledge of integrative processes. Partner company sites serve as applied research laboratories and living classrooms for interdisciplinary teams of professors, students, and seasoned systems engineering practitioners. In the final semester, each SDM student completes the thesis that covers research conducted.

Evaluation and Future Directions

SDM has benefited from a range of assessment activities in addition to the ongoing oversight provided by the Governing Board and Operating Committee and student entrance and exit interviews.

In 2002, the Engineering Systems Division formed a special committee to conduct a review of the program's three core courses. The program subsequently implemented recommendations from the committee for improvements to the academic content and delivery of two of the core courses.

SDM's distance-learning program, which provides virtually the same experience as the on-campus environment, is inherently expensive to maintain. Corporate sponsorship for the distance option has declined, raising concerns about its future viability. In 2003, the Deans of the Sloan School and the School of Engineering appointed a special faculty committee to review the SDM program and make recommendations for its future. The committee was asked to consider the overall academic content of the program as well as delivery modes in order to assure its long-term sustainability. The committee consulted broadly with the program's stakeholders, including students.

The program review found that students and graduates were very committed to the program and believed that the award of a joint degree by Engineering and Sloan reflected the uniqueness and value of the program. Within the Institute, the program has been especially important for the relatively new Engineering Systems Division, providing an avenue to explore system architecture and system engineering issues, to interact with industry, and to develop its educational and research agenda. Nonetheless, the program has not been entirely successful in articulating its value proposition to companies and potential students and has achieved less visibility than some other MIT professional programs. Going forward, the number of company-sponsored students is expected to remain relatively small. Beyond these market considerations, the committee sensed that the time was right for curricular renewal and for faculty recommitment to the program.

The committee recognized that the distance-learning option faces special challenges: it has been educationally successful, but it is more expensive for sponsor companies than programs that rely on distance education alone. One option proposed by the committee was to suspend the distance-education program as part of a redesign of SDM. Following consideration by the School of Engineering and the Sloan School of the conclusions reached by the program review, it was decided that the program should continue to be offered in the distance-learning as well as the on-campus format. The distance option has demonstrated educational success and offers participants a unique opportunity to combine the flexibility of distance education with the intensity and collegiality of on-campus instruction. The program has intensified its recruiting efforts and outreach to sponsor companies. Additionally, the distance-learning option has been opened to self-funded students, who are expected to participate through IP video using SDM-recommended equipment.

Singapore-MIT Alliance

Students in the Singapore-MIT Alliance (SMA), a collaboration in graduate education between MIT, Nanyang Technological University, and the National University of Singapore, receive their master's or doctoral degrees from the Singapore institutions, along with a certificate attesting to their participation in an SMA program. The second phase of SMA, now under development, will include programs leading to an MIT master's degree. While they will include substantial distance-education components, these programs will also meet the Institute's one-semester residency requirement. There are currently no plans to offer an MIT doctoral degree as part of SMA.

Descriptive Information

Academic Leadership

Professor Anthony T. Patera (Department of Mechanical Engineering), MIT Director, Singapore-MIT Alliance, and Professor Steven R. Lerman (Department of Civil and Environmental Engineering), MIT Deputy Director.

Report Contact

Mr. John Desforge, Assistant Director, Singapore-MIT Alliance, MIT Room 8-407, 77 Massachusetts Avenue, Cambridge, MA 02139; phone: (617) 452-3014; Email: desforge@mit.edu.

Web Resources

The SMA website (http://web.mit.edu/sma) provides a comprehensive overview of the SMA program, including academics, curriculum, admissions, and research initiatives. An overview of technical aspects of distance education delivery in the SMA program is available at http://web.mit.edu/sma/ about/edtech/index.htm.

SMA uses a course management system called Stellar ™ (V. 2.6), which was developed at MIT. General information about Stellar is located at http://stellar.mit.edu/. The list of current SMA course web sites on Stellar is located at http://web.mit.edu/sma/courses/materials/ index.htm. Directory services for contacting students, professors and staff are located at http://web.mit.edu/sma/about/directories/index.htm. Technicians use the following website to report, monitor and evaluate the quality of synchronous delivery: http://amps-tools.mit.edu/smatech/. Technical and administrative staff use the online calendar to for scheduling lectures, recitations, exams, and other beaming sessions: http://web.mit.edu/ sma/courses/calendar/ mit/Jun2004.html. Faculty and staff use the SMA intranet to share information and resources: http://amps-tools.mit.edu/smapriv/ (logon is faculty_MIT).

Technical Infrastructure

The SMA program uses both synchronous and asynchronous delivery from Cambridge to the students in Singapore. The synchronous, live, and interactive aspect of the program is conducted from one of our four distance education lecture halls fully equipped for H.323 videoconferencing and T.120 data sharing, and three videoconferencing-enabled Research Interaction rooms. SMA has priority access to these DE classrooms in the morning and evening hours when, due to time zone constraints, most SMA activity takes place. SMA faculty and students use the Research Interaction rooms for real-time communication and collaboration with their colleagues in Singapore outside of regularly scheduled class time.

The high-bandwidth network link connecting MIT sites with cooperating universities in Singapore includes MIT's 100-megabit Ethernet LAN and gigabit backbone, the Abilene backbone of Internet2, and a dedicated virtual circuit between the US mainland and Singapore. In addition, Internet2 can also be accessed by the SMA faculty communicating from their homes with their counterparts in Singapore via a specially configured server located at MIT.

The infrastructure supporting asynchronous learning for SMA classes is based on Stellar ™ (V. 2.6) and a 4-terabyte video server that provides streaming of SMA lectures in RealVideo format. All critical servers have built-in redundancy and are regularly backed-up. Access to online course materials is secure and limited to enrolled students, faculty, and appropriate staff.

Front-line support for Institute faculty participating in SMA is provided by the SMA distance education team, which is based in the SMA office and consists of a manager and two faculty liaisons. This group oversees both the synchronous and asynchronous delivery of the program and leads the long-term planning for the technology utilized by SMA. It also provides "high-touch" proactive support to MIT faculty participating in the program, including training, documentation, trouble-shooting, and help desk assistance. In addition, another support staff in the office regularly updates the SMA website.

The SMA DE team also manages the relationship with the Institute's Academic Media Production Services (AMPS), which conducts the live class sessions, oversees the distance education lecture halls, the Stellar ™ LMS, the videoconferencing equipped conference rooms, and the video server. AMPS additionally provides for digitization and streaming of the videos of SMA lectures.

Consortial Partners

SMA is a partnership among MIT, the National University of Singapore (NUS), and the Nanyang Technological University (NTU).

SMA is funded primarily by the Singapore Ministry of Trade and Industry--through the Agency for Science, Technology and Research (A*STAR) and the Economic Development Board (EDB)--and the Singapore Ministry of Education, NUS, and NTU.

Overview

The Singapore-MIT Alliance (SMA) is an innovative education and research collaboration among MIT, Nanyang Technological University (NTU), and the National University of Singapore (NUS). The largest interactive distance education collaboration in the world, SMA takes advantage of state-of-the-art synchronous and asynchronous facilities to achieve seamless instruction across 12 time zones. The voice delay between the classrooms in Cambridge and Singapore is less than a second.

The goals and aims of SMA are threefold:

- To set a new standard for international collaboration in graduate research and education.
- To invigorate engineering education in Singapore.
- To strengthen MIT through the extension of its global impact, the enhancement of its curriculum, and the improvement of its infrastructure.

Its innovative programs now stand at the forefront of graduate education in Asia and the world.

The current, first phase of SMA (SMA-1) was initiated in January 1999. The academic programs in Advanced Materials for Micro- and Nano-Systems and High Performance Computation for Engineered Systems were launched in July 1999. A third program, Innovation in Manufacturing Systems and Technology, was introduced the following July, and the last two programs, Molecular Engineering of Biological and Chemical Systems and Computer Science, got under way in July 2001. Students receive their degrees from one of the two participating universities in Singapore, with a certificate from MIT for their participation in the Singapore-MIT Alliance.

Research comprises an important aspect of the research master's and doctoral degrees in all five programs, and industry-sponsored research projects play an important role in the professional master's degree. Students have the opportunity to work with some of the most technologically advanced companies in the world through specific industry projects. An MIT and a Singaporean faculty member jointly supervise research students' theses.

In March 2003, the SMA partners signed a Memorandum of Understanding to develop SMA-2. This next five-year phase of the Alliance will be launched in July 2005. For the first time, SMA students in Singapore will have the opportunity to earn a master's degree from MIT as well as master's or doctoral degrees from the two Singapore universities. SMA-2 will also place greater emphasis on doctoral research and education, and greater interaction with industry and research institutes. In SMA-2, the scope of the program will also be expanded to incorporate the life sciences for the first time. Plans for SMA-2 are discussed at the close of this section

Distance and On-Campus Learning

Subjects are taught primarily by distance education. However, SMA students spend three weeks at MIT as part of the program, at a summer conference that is designed to help Singaporean students become immersed in the Institute environment and the SMA program. There are two components to the summer conference, Pre-Immersion and Immersion. The Pre-Immersion component consists of discussions with entrepreneurs in their respective fields, while the Immersion Program includes English-language workshops, lectures, and lab sessions taught by MIT faculty, interactions with Institute graduate students, and social gatherings and activities.

Doctoral students spend an additional full semester at MIT as Special Students, taking regular Institute graduate classes.

MIT faculty fellows also spend several weeks a year in Singapore, and some faculty spend from eight weeks to an entire semester engaging in face-to-face lecturing, discussion, and research collaboration in Singapore.

The three universities have combined their expertise and resources to create a distance-learning environment at the forefront of current technology. In partnership with faculty from both MIT and Singapore, SMA programs are designed to offer students full access to every element of course delivery in both synchronous and asynchronous form: Students attend live course lectures between universities, may interact with professors through videoconferencing, and review all lectures and materials electronically. At present, 75 percent SMA subjects in which MIT faculty members are involved are also cross-listed Institute courses with "local" MIT students in attendance.

A number of innovations in distance education are being developed through the SMA program. "Weblab" tools developed at MIT and partially supported by SMA have been successfully used to remotely operate device characterization equipment at MIT from NUS, enabling students to conduct real-time experiments at a distance of 8,000 miles from the lab.

Some courses developed for SMA programs are now also being delivered synchronously to students at Cambridge University in the United Kingdom under the auspices of the Cambridge-MIT Institute.

Annual SMA Symposia allow for intellectual exchange between MIT and Singapore Fellows and students and researchers from Singapore research institutes. The Symposia also provide an opportunity to evaluate progress and for students and faculty to interact with industry.

Governance

SMA is governed at three levels. At the top tier is the Governing Board, which comprises academic, government, and industrial leaders in Singapore and members of the faculty and administration at MIT. At the next level down is the Joint Academic Committee, which comprises administration and faculty from both MIT and Singapore. Finally, the individual academic programs are codirected by program chairs—one apiece from MIT and Singapore.

Administratively, SMA is managed by two codirectors and two co-deputy directors. On the MIT side, Professor Anthony T. Patera (Mechanical Engineering) serves as director of the MIT Center for the Singapore-MIT Alliance and Professor Steven R. Lerman (Civil and Environmental Engineering) as the deputy director. Within the Institute, SMA reports to the Dean of Engineering.

Faculty

Each program has a minimum of six faculty SMA Fellows from MIT and an equivalent number from either NUS or NTU. Other faculty members participate as SMA Associates, who assist the Fellows by giving several lectures each year. During academic year 2003-04, about 45 members of the Institute faculty participated in SMA.

Roughly three-quarters of the MIT faculty participating in SMA do so as SMA Fellows. In addition to distance interaction, Fellows typically spend from two to four weeks each year in Singapore. Most will also spend one extended period in Singapore, typically between eight weeks and a full semester in duration.

Students

The targeted number of students enrolled in each program is 50: approximately 35 professional master's students enrolled in a one-year (12-month) course of study, with the remainder enrolled in research master's or doctoral programs. Through 2004, SMA has graduated a total of 552 master's students and six doctoral students from the Singaporean universities.

From the start, admission has been highly competitive. None of the master's programs has admitted more than 22 percent of applicants over the life of the program; the most selective, Computer Science, has admitted only 10 percent of applicants. Overall, 18 percent of applicants have gained admission. The yield on offers of admission for the five programs has ranged from 51 to 69 percent, with an overall average of 58 percent.

Graduate Record Examination (GRE) scores are waived for students from top schools in Singapore. However, those student scores obtained compare favorably with the scores of students being admitted to graduate programs in MIT's Departments of Aeronautics and Astronautics, Mechanical Engineering, and Materials Science and Engineering and the Leaders for Manufacturing program.

Over 95 percent of SMA students have graduated on time. Most of these students obtain employment upon graduation in either industry or government. Students come from many countries besides Singapore, including China, India, Vietnam, and Australia; about 75 percent of the SMA students from other countries stay in Singapore upon graduation. SMA graduates have taken positions at many leading businesses in Singapore including Motorola, Hewlett-Packard, Philips Electronics, Singapore Airlines, Apple Computer and Dell. Two SMA students have obtained faculty positions at universities in Singapore, one at NUS and the other at NTU.

Academic Programs

The SMA degrees in Advanced Materials for Micro- and Nano-Systems offer broad foundations in advanced materials. They cover the fundamentals of electrical, optical, magnetic, and mechanical properties of materials and the fundamentals of processing of materials for high-technology applications, with an emphasis on applications in microelectronics.

The S.M. degree in advanced materials constitutes a 12-month program, including three subjects in the necessary fundamentals and three electives with a focus on microelectronics. The degree also offers students an opportunity to carry out a semester-long research or industry project. The M.Eng. degree includes a similar but more rigorous core curriculum and a master's thesis jointly supervised by SMA fellows from Singapore and MIT. The Ph.D. degree includes an expanded choice of elective subjects and a minor subject selection outside of the materials area.

The research collaboration growing from co-supervision of M.Eng. and Ph.D. student research has already led to the submission of joint publications and presentations at an international conference. An SMA graduate student received the Silver Award at the 2003 Materials Research Society Spring Meeting.

The SMA program in High Performance Computation for Engineered Systems is focused on high performance computation simulation and optimization of engineered systems. High performance computation is a crucial component in the modeling, simulation, design, optimization, control, and visualization of engineered systems in a wide range of technology and service industries. Students learn to apply and develop advanced numerical techniques for simulation and optimization relevant to a diverse set of applications from aerospace, electrical, industrial, mechanical, and other engineering fields, as well as logistics, management, and finance. The program has chosen the broad area of "Effective Computation for Design and Operation of Engineered Systems" as its research theme.

The S.M., M.Eng., and Ph.D. degree programs all include a core curriculum; in addition, the M.Eng. degree requires a master's thesis, while the Ph.D. degree requires several additional advanced courses and a doctoral thesis. The S.M. degree focuses on the critical and effective application, modification, and integration of existing simulation and optimization software. The M.Eng. and Ph.D. degrees emphasize the formulation, analysis, and implementation of new computational methods for the simulation and optimization of engineered systems.

Degree programs in Innovation in Manufacturing Systems and Technology include the S.M., the M.Eng., and the Ph.D. They offer highly competitive courses of study that explore the many facets of manufacturing technology. Challenging coursework integrates the process, product, system, and business aspects of this vibrant industry while focusing on the core of manufacturing systems. Advanced coursework exposes students to innovative theories and methodology, as well as a rigorous investigation of financial, strategic, and global aspects of technology innovation and new business generation.

The S.M., M.Eng., and Ph.D. degree programs all include a core curriculum. The S.M. degree includes a theme project, the M.Eng. degree includes a master's-level research thesis, and the Ph.D. degree includes additional subjects on advanced topics in each of the fundamental areas.

The S.M. degree program is aimed at practitioners who will use this knowledge to become leaders in existing as well as emerging manufacturing companies. The M.Eng. and Ph.D. degree programs will prepare students for careers in industrial research and development centers, research institutes, or academic departments interested in fundamental research in manufacturing.

The Molecular Engineering of Biological and Chemical Systems program offers two innovative courses of study (S.M. and Ph.D.) that integrate a molecular understanding of biological and chemical phenomena with advances in process engineering for the life sciences and fine chemical industries.

The professional master's degree program prepares graduates for the shaping and solving of complex problems, resource management, teamwork, and leadership. The Ph.D. program prepares graduates for advanced careers in industrial research and development centers, research institutes, or academic departments interested in biological and chemical engineering processes with emphasis on synthesis skills, engineering design, and interdisciplinary approaches.

The program provides a unique and bold educational opportunity for graduate students interested in pursuing careers at the frontiers of life science and fine chemical technologies. Students attending this program have ample opportunity to work with some of the most technologically advanced companies in the world through specific industry projects. The program is designed to prepare future leaders for positions in knowledge-driven industries poised for global economic growth in the new millennium.

The SMA program in Computer Science provides a unique educational experience for graduate students interested in careers in industry and research establishments. The students are exposed to the broad foundations of computer science, encompassing computer architecture, software systems, algorithms, and advanced applications.

The S.M. in computer science is a one-year professional degree program based on coursework that prepares graduates for careers in the development of advanced computer systems. It is aimed at training students to apply their knowledge of computer science to industrial problems, particularly in the development of large software systems and embedded computing. The Ph.D. program in computer science is a research program that provides the necessary depth to equip graduates for careers in industrial research and development centers, research institutes, or academic departments interested in cutting-edge research in all aspects of computer science.

Evaluation and Plans for SMA-2

MIT and its partners in Singapore have watched the development of SMA closely. The success to date suggests that important aspects of rigorous professional and doctoral education can be pursued at a distance. These encouraging results have prompted plans for the establishment of a second five-year phase of SMA.

One of the key questions has obviously been whether the SMA model of distance education really works. Since research interactions take longer to develop, the evidence relates largely to coursework. Our assessment of the question relies in part on circumstantial evidence. Good students find the SMA program very attractive. Average GRE scores have been commensurate with the scores of Institute students in participating departments. Both selectivity and yield are very high. Once in the SMA programs, SMA students do as well in MIT classes as their MIT residential counterparts: on this point the statistical evidence is unambiguous.

SMA surveys the Institute students enrolled in SMA classes at the end of each semester. Our data indicate the students enjoy the courses and do not find participating alongside another set of students at a distance a distraction; they say that the course materials are on average better than in their other MIT courses.

It is, however, clear that students who have participated in MIT classes at a distance and on campus prefer the on-campus experience. Most Institute faculty still find it easier to interact with students in the classroom (and beyond) in the old-fashioned way. The communications technology can at times be intrusive for those at a distance and on campus. And preliminary research suggests that in the doctoral programs considerable face-to-face interactions are a prerequisite for subsequent successful mentoring relationships. On balance, however, the SMA-1 evidence supports the premise that parts of an MIT education can be gainfully pursued at a distance.

Moreover, SMA has strengthened education at the Institute. It has facilitated the development and maintenance of new distance-enabled classrooms, served as sponsor or test site for many technological innovations now deployed more broadly across campus, and sponsored many activities to bring distance technology to a broader cross-section of the MIT community. It has also stimulated interdisciplinary curriculum development and research activities, introduced new courses open to MIT as well as SMA students, and enhanced existing courses that have been redesigned for SMA participation.

This second five-year phase of the Singapore-MIT Alliance will be launched in July 2005. For the first time, SMA students in Singapore will have the opportunity to earn a master's degree from MIT as well as master's or doctoral degrees from the two Singapore universities. (Graduates now receive a certificate from MIT for their participation in the Singapore-MIT Alliance.) SMA-2 will also place greater emphasis on doctoral research and education, and greater interaction with industry and research institutes. The scope of SMA-2 will also be expanded to incorporate the life sciences.

All programs will offer a Ph.D. degree from NUS or NTU. The Ph.D. programs will generally take the form of NUS/NTU degrees with an SMA certificate from MIT, as currently practiced in SMA-1. At least three of the programs will offer a master's degree. Students will receive two degrees (dual, not joint): a master's degree from MIT and a master's degree from NUS/NTU, or a master's degree from MIT and a Ph.D. from NUS/NTU. These students must satisfy the

admission and degree requirements at each university as defined and approved by the respective faculties in accordance with standard institutional policies. In short, the dual-degree student is no longer an SMA student but a full MIT student, as well as a full NUS/NTU student.

In order to safeguard the core values underlying MIT degrees, all aspects of SMA-2 will honor all standard Institute rules and regulations. The MIT degree associated with the double degree must be either an existing Institute degree or a new degree approved through the usual MIT processes. Most are expected to be existing degrees. The degree must satisfy all MIT requirements including the one-semester residency requirement for a master's degree. Admission will follow the current practice of departmental review committees, and NUS or NTU faculty participating in activities with MIT's SMA students will be required to obtain appointment through the regular processes as a visiting member of the faculty or a visiting research scientist.

The broad areas of interest to SMA-2 include advanced materials, computational engineering, genomics/ molecular and cell biology, manufacturing systems and technology, and micro- and nanotechnology and systems. Within these broad areas, MIT departments will have the opportunity to participate in an open competition to design the new academic programs for SMA-2.

The teaching and research components of the programs will be tightly coupled through both inter-university and special "flagship" research projects. These projects aim to foster collaboration between faculty members of the Alliance universities; provide opportunities for individual student-faculty mentoring; develop the core programmatic disciplines; establish links to the academic programs; and yield high-impact research results relevant to the Singapore economy.

CIHE DATA FORMS FOR REPORT ON DISTANCE EDUCATION PROGRAMS

INSTITUTION: Massachusetts Institute of Technology

TABLE 1. Program and Certificate Description

Note: ***For Enrollment and other data, use data from current or most recently completed semester for which data are available.***

Programs and Certificates in which 50% or more of the courses may be completed entirely on-line

Program or Certificate Name	Level of Degree (A, B, M, D) or Certificate (C)	Initiation Date (First Enrollment) (Year Only)	Number of Required Credits	No. of Credits Which May be Completed On-Line
Systems Design and Management	M	1997	N/A	N/A

Insert additional rows for more programs, if needed.

Scroll down to next table

CIHE DATA FORMS FOR REPORT ON DISTANCE EDUCATION PROGRAMS

INSTITUTION: Massachusetts Institute of Technology

TABLE 2. Students

Note: ***For Enrollment and other data, use data from current or most recently completed semester for which data are available.***

Programs and Certificates in which 50% or more of the courses may be completed entirely on-line

Program or Certificate Name	Matriculated Students	Degree or Certificate Completers to Date	Total Number of Students Taking Courses on Ground*	In-State Students Taking Courses On-Line	Out-of-State Students Taking Courses On-Line	Students Based in Other Countries Taking Courses	Total Number of Students Taking Courses On-Line
Systems Design and Management	54	30	20	3	28	3	**34**
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
TOTAL	**54**	**30**	**20**	**3**	**28**	**3**	**34**

Insert additional rows for more programs, if needed.

***Students enrolled in programs described in this table.**

Scroll down to next table

CIHE DATA FORMS FOR REPORT ON DISTANCE EDUCATION PROGRAMS

INSTITUTION: Massachusetts Institute of Technology

TABLE 3. Faculty

Note: *For Enrollment and other data, use data from current or most recently completed semester for which data are available.*

Programs and Certificates in which 50% or more of the courses may be completed entirely on-line

Program or Certificate Name	Faculty Teaching in The Program (Headcount)				FTE Faculty in Program	Number with Highest Degree	
	Faculty Employed Full Time at The Institution		Faculty Employed PT at The Institution	Total Faculty in Program			
	FT in Program	PT in Program				Ph.D or Equivalent	Masters or Equivalent
				0			
				0			
				0			
				0			
				0			
				0			
				0			
				0			
				0			
				0			
				0			
				0			
				0			
				0			
				0			
TOTAL	0	0	0	0	0	0	0

Insert additional rows for more programs, if needed.

Scroll down to next table

CIHE DATA FORMS FOR REPORT ON DISTANCE EDUCATION PROGRAMS

INSTITUTION: Massachusetts Institute of Technology

TABLE 4. Course enrollments and completions

Note: ***For Enrollment and other data, use data from current or most recently completed semester for which data are available.***

Programs and Certificates in which 50% or more of the courses may be completed entirely on-line

Courses Offered On-Line	Fall	Spring	Year Total*	Fall	Spring	Year Total*	Fall	Spring	Year Total*
Undergraduate									
Total Number of courses									
Total on-line enrollments									
On-line course completions									
Graduate									
Total Number of courses									
Total on-line enrollments									
On-line course completions									
TOTAL									
Total Number of courses	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total on-line enrollments	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
On-line course completions	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

* For year total, include all offerings, including Fall and Spring terms, short-terms, summer, and non-term-based offerings

MAJOR CHANGES SINCE 1999

Introduction

Over the five years since its 1999 evaluation for continued accreditation by the Commission on Institutions of Higher Education of the New England Association of Schools and Colleges, the Massachusetts Institute of Technology has continued to evolve in response to the needs and aspirations of its students, faculty, and staff, and to meet the demands placed by a rapidly changing environment. This overview of major changes is inevitably selective and focuses on issues relevant to four of the Commission's standards for accreditation—organization and governance, programs and instruction, faculty, and financial resources—particularly as they affect the undergraduate educational experience.

The mission statement formally adopted in advance of the 1999 evaluation continues to describe succinctly the Institute's mission and purposes and appears at the head of the institutional overview above.

One especially important initiative relevant to the Commission's standard on planning and evaluation, the Task Force on the Undergraduate Educational Commons, is discussed in the section below on efforts to increase institutional effectiveness. Major changes with respect to student services, library and information resources, and physical resources are reviewed earlier in this report in the discussions of areas identified by the Commission for special emphasis.

The Institute continues to strive to fulfill the responsibilities of public disclosure by presenting complete, accurate, and clear information to students and members of the interested public. MIT also seeks to maintain the highest ethical standards in its teaching, research, and administration, conveying its expectations for trustees, faculty, students, and staff through clearly articulated policies and procedures.

Organization and Governance

The largest change in MIT's administrative organization since the 1999 evaluation was the reorganization that divided the existing Office of the Dean of Students and Undergraduate Education into two separate organizations reporting to new Deans for Undergraduate Education and for Student Life. These changes are reviewed in detail in the section on student life and learning above.

The last five years have seen a number of changes within the senior administration of the Institute:

- In 2001, Chancellor Lawrence S. Bacow was named President of Tufts University. Associate Provost Phillip L. Clay was appointed to succeed Professor Bacow as

Chancellor, and Professor Claude R. Canizares, Director MIT's Center for Space Research, was named Associate Provost.

- That same year, J. David Litster, Vice President and Dean for Research, stepped down at the conclusion of two five-year terms. Alice Petry Gast, a chemical engineer who had previously been a member of the faculty at Stanford University, was appointed Vice President for Research and Associate Provost to succeed Professor Litster.

- Other new academic and administrative leaders appointed since the 1999 evaluation include Adèle Naudé Santos, Dean of the School of Architecture and Planning; Jerrold M. Grochow, Vice President for Information Services and Technology; and Robert J. Silbey, Dean of the School of Science.

The Institute has also seen changes in its trustee leadership. In July 2004 Dana G. Mead, retired Chairman and CEO of Tenneco, Inc., succeeded Alex d'Arbeloff as Chair of the MIT Corporation. Dr. Mead brings to leadership of the trustees an unusual breadth of experience in academia, government, and industry and real understanding of the work of a great research university. A graduate of West Point, he received the Ph.D. in political science from MIT in 1967.

In December 2003 President Charles M. Vest announced his decision to step down from the presidency during the 2004-05 academic year, after nearly 14 years of extraordinary service. On August 26, 2004, the MIT Corporation elected Susan Hockfield, a distinguished neuroscientist who is currently Provost at Yale University, as the Institute's 16th president. She is expected to take office in early December 2004.

The search for a new president was led by the Corporation Committee on the Presidency (CCOP), a 14-member group of trustees. The CCOP worked closely with the Faculty Advisory Committee to the Corporation, a committee of 17 members of the MIT faculty.

Throughout the early months of 2004, the CCOP and the Faculty Advisory Committee sought the ideas and suggestions of persons from all constituencies of the Institute community. The committees encouraged faculty, students, staff, administration, and alumni to offer their thoughts on the issues and challenges facing MIT in this decade and on the experience and personal qualities the committees should be looking for in a new president. The committees also welcomed nominations of individuals who might be considered for the presidency.

Mechanisms were developed to allow various constituencies to personally convey thoughts and ideas to the committees. A Student Advisory Group provided students a direct advisory mechanism. Staff and administration have used existing groups such as the Administrative Council and the Working Group on Support Staff Issues to play important roles in informing the work of the committees.

The bylaws of the MIT Corporation provide that responsibility for the nomination of the President shall rest with the Executive Committee of the Corporation, which received the recommendation of the CCOP in favor of Dr. Hockfield. The Executive Committee then made a formal recommendation to the full Corporation, which has the responsibility to elect the President.

Dr. Hockfield, who has been a member of the Yale faculty since 1985, served as Dean of Yale's Graduate School of Arts and Sciences from 1998 until she became Provost in January 2003. In announcing her election as MIT's 16th president, Dr. Mead said, "As a strong advocate of the vital role that science, technology, and the research university play in the world, and with an exceptional record of achievement in serving faculty and student interests, Dr. Hockfield is clearly the best person to lead MIT in the years ahead. She brings to MIT an outstanding record as teacher, scientist and inspirational leader with a reputation for bringing out the best in all the people with whom she works."

Among other priorities, Dr. Hockfield has said she intends to use her new position to encourage collaborative work among MIT's Schools, departments, and interdisciplinary laboratories and centers to keep the Institute at the forefront of innovation. She sees MIT's strength in engineering uniquely positioning the Institute to pioneer newly evolving, interdisciplinary areas and to translate them into practice. She also hopes to accelerate the national discussion on improving K-12 science and math education. She believes strongly in the value that international students and scholars bring to the educational and research programs of American universities, and in the importance of American universities working closely with leading academic centers around the world.

Programs and Instruction

The Institute seeks to ensure that its programs of instruction meet the highest academic standards. This entails regular review at levels ranging from the individual program or department to the MIT Corporation, through its Visiting Committees and its approval of new degree programs as recommended by the Faculty.

This overview of major changes in programs and instruction over the last five years will focus on undergraduate education. All MIT undergraduates must complete the General Institute Requirements (GIRs), which are intended to offer a broad education in humanistic and scientific disciplines. Students major in the physical or biological sciences, in management science, in architecture or urban studies and planning, in an area of the humanities, arts, and social sciences, or in one of the engineering fields. The numbers of students in the various undergraduate majors appear in the data forms appended to this report.

General Institute Requirements

The General Institute Requirements are being evaluated as one aspect of the work of the Task Force on the Undergraduate Educational Commons, which is undertaking a comprehensive assessment of the educational experiences common to all undergraduates. The goals of the Task Force, and its progress to date, are reviewed in the section below on efforts to enhance institutional effectiveness.

The current components of the GIRs are as follows:

- Six core subjects in biology, chemistry, mathematics, and physics.
- Two Restricted Electives in Science and Technology, at least one of which must be outside a student's own department.
- One Laboratory subject of 12 units, or two Laboratory courses of at least six units each.
- The Humanities, Arts, and Social Sciences (HASS) Requirement (eight subjects).

- The Communication Requirement (four subjects).
- The Physical Education Requirement.

The most recent change to the General Institute Requirements has been the implementation of a new Communication Requirement. In 1997, the Faculty approved the development of experimental writing and communications subjects that would test different models for incorporating communication-intensive subjects into the first-year curriculum, the General Institute Requirements, and departmental degree programs. With support from the National Science Foundation, a proposed new Communication Requirement was developed and pilot subjects offered.

The new Communication Requirement was approved by the Faculty in March 2000 and went into effect in Fall 2001 for undergraduates in the Class of 2005. The Communication Requirement replaces the Writing Requirement with an instructionally based requirement focused on developing written and oral communication skills at the general level and in the student's major field of study. To oversee the Communication Requirement, the Subcommittee on the Communication Requirement was charged as a permanent subcommittee of the Committee on the Undergraduate Program. Within the Office of the Dean for Undergraduate Education, a dedicated office was established to coordinate implementation of the requirement and administer students' progress in satisfying this component of the undergraduate education. The Institute has committed substantial financial resources to ensuring that the Communication Requirement is not an unfunded mandate to the departments, particularly as they work to incorporate more communication intensive instruction and practice into departmental subjects.

The Communication Requirement consists of four Communication Intensive subjects (CI) sequenced throughout the undergraduate program. Students take two such subjects (CI-H) from among the subjects that fulfill the General Institute Requirement in the Humanities, Arts, and Social Sciences (HASS) and two (CI-M) in the major. To support the sequencing, students must maintain a minimum pace in satisfying the Requirement with one subject completed by the end of the first year, two by the end of the second, three by the end of the third, and four by graduation. Generally, students take one CI-H subject in each of their first and second years and one CI-M subject in each of their third and fourth years.

CI-H subjects provide instruction and practice in effective exposition. Before being designated as CI-H, subjects are reviewed by the HASS Overview Committee to ensure that they meet the criteria. Prior to beginning classes, all first-year students take the Freshman Essay Evaluation, which serves as a placement tool for CI-H subjects. Students who would benefit from an experience focused on expository communication are required to take a CI-HW subject as their first Communication Intensive class; students who would benefit from instruction and practice in English as a Second Language are directed to appropriate ESL subjects. More than 100 CI-H subjects are offered annually.

CI-M subjects provide instruction and practice in the modes of communication appropriate to the major discipline. Each undergraduate degree program must include at least two CI-M subjects as part of its curriculum, and students should be able to complete the degree requirements within the unit and subject limits specified by the Faculty. CI-M subjects vary in format from laboratory classes, in which students write, revise and present laboratory reports; to seminars, in which they prepare and lead discussions; to senior theses and independent

research projects. CI-M subjects are approved by the Subcommittee on the Communication Requirement. In academic year 2004-05, approximately 130 CI-M subjects will be offered.

Grading, Advanced Placement Credit, and Prerequisites

Another change affecting all undergraduates has been the introduction of letter grades for subjects taken and passed by first-year students in their second semester at MIT. This change, effective in academic year 2002-03, came after more than three decades in which letter grades for first-year students were not reported for either term on external grade reports: The Institute adopted Pass/Fail grading for first-year students in 1968 and Pass/No Record (P/NR) grade reporting in 1973.

In October 1999, a subcommittee of the Committee on the Undergraduate Program was charged with reviewing the P/NR policy and advanced placement credit. The draft report of the CUP subcommittee was presented to the Faculty in November 2000, launching a period of public comment and consultation including student forums as well as meetings with individual academic departments and relevant faculty committees. As a result of these discussions an implementation subcommittee was formed, and final recommendations articulated.

The CUP subcommittee found that P/NR grading provided an effective transition from high school to MIT during the first term, but that its benefits diminished in the second term. P/NR grading hindered the transition to the sophomore year, undermined mastery of fundamental material, and encouraged students to take unduly difficult subjects. These conclusions were borne out by comparative data on grades and the use of student time. At the same time, the transition to letter grading in the second year had its own drawbacks, since too many first-year students failed to take advantage of Pass/No Record grading to explore new areas of interest. Students often entered majors before taking any subjects in their chosen field and thus might make wrong choices. The second year itself offered no flexible grading option.

The subcommittee identified a related cluster of issues with respect to prerequisites. Uncertainty and confusion existed among the faculty about the right of an instructor and/or department to exclude students without proper prerequisites. Under P/NR grading, some first-year students took advanced subjects without appropriate prerequisites in order to "get them out of the way." Practices were inconsistent: some faculty and departments did actively enforce prerequisites.

The subcommittee recognized that advanced placement credit allowed first-year students with varying backgrounds to enter the Institute at an appropriate level but was nonetheless uneasy with granting college credit for high school work. Faculty oversight of the advanced placement policy had been uneven. The administration of advanced placement by the Admissions Office dated to an earlier era when members of the faculty were in charge of admissions.

In April 2001 the Faculty approved the final recommendations of the CUP with respect to these issues:

- Effective with academic year 2002-03, students in the second term of their first year have received grades of A-B-C/No External Record. (Non-passing grades are recorded by the Registrar for use within the Institute only and do not appear on official MIT transcripts.) Passing grades are included in the calculation of students' grade point averages. It was

agreed that the policies on reporting first-year grades would be reviewed during academic year 2006-07.

- The Faculty also supported a new experiment authorized by the CUP in conjunction with the changes in first-year grading policy—the sophomore-year exploratory subject, a response to the finding that students were not exploring new intellectual areas during the sophomore year. Beginning in academic year 2003-04 and continuing for five years, sophomores have been allowed to designate one subject per term as an "exploratory subject." This option allows students to forfeit the grade and units and change their status to "Listener" before registration day of the succeeding term. Students taking a subject on an exploratory basis are not so identified to the instructor, and grading standards remain unchanged. The Office of the Dean for Undergraduate Education has been asked to monitor the use of this option and to collect statistics and identify trends in anticipation of a review in academic year 2005-06.

- The Faculty affirmed the right of instructors to exclude from their subjects students who do not have the prerequisites previously approved by the appropriate faculty committee and listed in the subject description. The Registrar was asked to take the necessary actions to assist instructors in enforcing prerequisites, and the Committee on Curricula to ask departments to review current prerequisites listed for undergraduate subjects in the catalogue to ensure that subjects identified as "prerequisite" should be completed prior to enrollment.

- Finally, the Faculty endorsed the proposal that oversight of advanced placement credit be the shared responsibility of CUP (for subjects satisfying the Science Requirement); the Dean of the School of Humanities, Arts, and Social Sciences (for subjects satisfying the HASS requirement); and the Committee on Curricula (for all other undergraduate subjects). As the faculty committee "exercising oversight responsibility for undergraduate education, including the freshman year," the CUP retains oversight of general policy regarding advanced placement credit. As recommended by CUP, the administration of advanced placement credit was subsequently transferred from the Admissions Office to the Office of Academic Services.

The data to date suggest that the change to letter grading in the second semester of the first year has been helpful in deterring students from taking classes for which they were unprepared. One emerging trend is an increase in the number of first-year students accepting sophomore standing. Before the grading change, early sophomore standing required students to give up the protection of no letter grades; now that this is standard, more students are opting for sophomore status, which removes the credit limit to which first-year students are subject.

The Committee on the Undergraduate Program has also been watching closely sophomores' use of the option to designate one class each term as "Exploratory." During the first year the option was available, 289 students chose to designate one of their subjects as "Exploratory" in the fall term; ultimately, 64 of them opted to convert the subject to Listener status. In the spring, 320 students chose to designate a subject as "Exploratory," with some 34 conversions to Listener status to date.

Undergraduate Majors and Minors

Since the 1999 evaluation, the Faculty has approved the establishment of two new undergraduate programs. The first of these, approved in May 2000, was a new S.B in Physics (Course 8-B; http://web.mit.edu/catalogue/degre.scien.physi.shtml#under). The Department of Physics offers this new degree in addition to its previously existing S.B. program (Course 8) and an S.B. offered in cooperation with the Department of Electrical Engineering and Computer Science (Course 8-A). The establishment of the new degree recognized that while the longstanding S.B. program provides an unsurpassed preparation for graduate study in physics, many students have broader interests that will take them into other careers after graduation and may not be as well served by it. Moreover, the Course 8 requirements for advanced undergraduate subjects leaves students little opportunity to explore other areas.

The new Course 8-B option provides students with an understanding of the fundamentals of physics with an appreciation of the physicist's approach to problem solving, while requiring a focus in some area that will support career paths other than a Ph.D. in physics. The requirements include a set of core subjects in physics and a focus composed of three subjects in a field chosen by the student. The focus will build on a foundation in physics, but may not necessarily be in an area of physics. (The degree requirements are outlined at http://web.mit.edu/catalogue/degre.scien. ch8b.shtml.) While offering students more flexibility, the new degree program remains rigorous, requiring more courses than honors degrees in physics at peer institutions. The preexisting Course 8 degree will remain the program of choice for those planning on graduate work in the field.

The second new undergraduate program approved since the 1999 evaluation is an S.B. in Chemical-Biological Engineering (Course 10-B; http://web.mit.edu/catalogue/degre.engin.chemi.shtml#under), approved in December 2003. The establishment of this new program in the Department of Chemical Engineering is one important manifestation of the growing desire among faculty and students across the School of Engineering to explore the engineering possibilities unlocked by the molecular and genomic revolutions in modern biology, in order to develop dramatic new solutions to problems of health and the environment.

The Dean of the School of Engineering has estimated that about a third of the faculty in the School are now interested in bioengineering. The School established the Biological Engineering Division in 1998 to provide a multidisciplinary approach to the solution of challenges at the interface of modern biology and engineering. Within the School, research in bioengineering takes place not only in Biological Engineering and Chemical Engineering but also in the departments of Electrical Engineering and Computer Science, Materials Science and Engineering, and Mechanical Engineering.

The Biological Engineering Division does not currently offer an undergraduate major but does field minor programs in Toxicology and Environmental Health and Biomedical Engineering—the most popular minor at MIT; it anticipates presenting a proposal for its own undergraduate degree program to the Faculty during academic year 2004-05. This program is expected to have different goals and serve a different audience from the new program in the Department of Chemical Engineering. The new degree in Biological Engineering will focus on engineering science at the interface between modern biology and life sciences and engineering science. The program is distinct from traditional biomedical engineering and will reinforce MIT's thrust into teaching and research in the life sciences.

Together, the new degree programs in Chemical-Biological Engineering and Biological Engineering, with the existing minor in Biomedical Engineering, will offer students exceptional opportunities for study in one of the most exciting fields in engineering. The Dean has estimated that the Institute might expect as many as one-quarter of its engineering students to pursue the new majors.

The Department of Chemical Engineering has long played a leading role in developing engineering applications of biological systems at both the cellular and molecular levels, and offered the first biomedical engineering class at MIT more than 35 years ago. Biological ideas and applications have become important to the teaching and research of an increasing number of the department's faculty. The new S.B. in Chemical-Biological Engineering will be offered alongside the department's existing S.B. program (Course 10) and an S.B. intended for students who wish to specialize in other areas after an introduction to chemical engineering methods (Course 10-C).

The structure of the Course 10-B degree parallels that of the traditional Course 10 program. In addition to the General Institute Requirements, both programs have three areas of emphasis:

1. Fundamental education in chemistry and biology delivered by faculty of these respective science departments;
2. Education in the triad of core chemical engineering sciences: thermodynamics, transport, and kinetics with an emphasis on quantitative methods of analysis;
3. Integration and synthesis of fundamental science and engineering science principles for solving engineering problems and understanding complex systems.

The overall number of required units and number of subjects for the Course 10 and 10-B degrees are identical. In addition, the early requirements are similar so that undergraduates should have the ability to switch between the 10 and 10-B programs after the sophomore year. (The degree requirements are outlined at http://web.mit.edu/catalogue/degre.engin.ch10b.shtml.) The curriculum reflects the department's fundamental belief that its students should learn chemistry from chemistry faculty and biology from biology faculty, and that the end product should be relevant to industry. Graduates from the new program are expected to have the opportunity to move into a very diverse range of fields.

Since the 1999 evaluation for continued accreditation, one new undergraduate degree program has been established on an experimental basis under the authority designated by the Faculty to the Committee on the Undergraduate Program. This new program in Comparative Media Studies (CMS) offers students the opportunity for interdisciplinary study of film, television, and other communications media. The program's goal is to develop an understanding of the historical, cultural, and artistic significance of film and other modern media.

The new program grows out of two decades of instruction in the field. Founded in 1984 as Film and Media Studies, the undergraduate program initially offered students a concentration; in the early 1990s, a minor program and a major departure in Humanities were established. In 1998, the name of the undergraduate program was changed to Comparative Media Studies and a graduate program launched.

The new CMS undergraduate program is MIT's first interdisciplinary full major. Subjects in the its core curriculum are regularly taught by faculty from a broad range of disciplinary

backgrounds: Architecture (History, Theory, and Criticism of Art and Architecture section), Anthropology, Foreign Languages and Literatures, History, Literature, Media Arts and Sciences, Music and Theater Arts, Philosophy, STS (Science, Technology, and Society), and Writing and Humanistic Studies. As an experimental program, the S.B. program in CMS must be reviewed after five years; a three-year interim review is also anticipated.

During spring 2003, the Faculty approved new guidelines for the review and approval of proposed new undergraduate degree programs. These new guidelines clarified expectations with regard to the content of departmental proposals; delineated the respective roles of the Committee on Curricula, the Committee on the Undergraduate Program, and the Faculty Policy Committee in the review process; and laid out criteria for the evaluation and termination of existing academic programs.

The first undergraduate degree program to be reviewed in accordance with the new guidelines is an S.B. in Archaeology and Materials (Course 3-C). The Department of Materials Science and Engineering has offered the degree on an experimental basis, and the Committee on the Undergraduate Program has recommended that it be established by the Faculty on a permanent basis. The program is relatively small, but its students have been very enthusiastic and are producing prize-winning work. No other undergraduate program in the U.S. integrates archaeology, anthropology, geology and materials science in a comparable way. The proposal to make the degree permanent was reviewed by the Faculty in May 2004 and will be presented for its approval in September 2004.

MIT has offered undergraduates the opportunity to pursue minor programs in the humanities, arts, and social sciences since 1988, and in other fields since 1992. Today, most degree-granting departments and programs offer one or more minor options. HASS minors build on students' required HASS concentrations to study a field in greater depth. Since 1999 three new minors have been established:

- The minor program in Toxicology and Environmental Health, offered by the Biological Engineering Division, offers addresses the growing demand for undergraduate majors in science and engineering to develop an appreciation for the impact of new products and processes on human health. Each core course applies principles of chemistry, biology, and engineering to issues of human health, and each provides the student with an in-depth experience in one facet of a paradigm that relates human disease to exposure to chemicals and microorganisms.

- The HASS interdisciplinary minor in Public Policy, administered jointly by the Department of Urban Studies and Planning and the Department of Political Science, is designed for science and engineering students who would like to understand better the many ways that their field of technical expertise may influence and be influenced by federal, state, and local policies. The minor introduces the fundamental concepts and ideas that guide how we think about public policy and government action, explores methods of policy analysis, and offers an in-depth exploration of a specific policy field.

- Academic year 2004-05 sees the launch of new HASS interdisciplinary minor in Applied International Studies, overseen by the Department of Political Science. Recognizing that theoretical learning should be combined with hands-on experience, the minor includes a stay-abroad component in addition to study of language and culture and of

international politics, economics, and history. The experience abroad will typically take place within the structure of an internship or study abroad. The minor is working closely with the MIT Initiatives in Science and Technology, which offers students intensive professional internships in companies, research laboratories, and universities around the world.

In a particularly important development, the Sloan School of Management is currently developing plans to offer an undergraduate minor for the first time. The objective of this minor will be to provide students with an understanding of the economic, social, and organizational contexts within which scientific and technical work takes place. The new minor is expected to be of interest to many students: one survey conducted a few years ago showed that approximately one-half of all MIT undergraduates would be interested in a Sloan minor. A Sloan faculty committee is designing the new minor program in consultation with students, alumni, and the relevant committees of the MIT Faculty. Sloan's proposal will be presented to the MIT Faculty in academic year 2004-05. If approved, a pilot version of the program, with limited enrollment, will be launched in fall 2005.

Innovation in Undergraduate Education

The last few years have seen a tremendous amount of educational innovation across the Institute. Some of these innovations have been reviewed in earlier sections of this report, such as experiments in the use of educational technology (discussed in the section on distance education), and service learning (discussed in the section on student life and learning). In this discussion we will focus on the growing interest in new teaching methods and on two large-scale initiatives at the undergraduate level, the Undergraduate Professional Opportunities Program and student exchanges with Cambridge University in the United Kingdom.

New Ways of Teaching

In recent years members of the MIT faculty have shown great interest in the use of new teaching methods, often based on problem-based or active learning. Subjects that have been developed or reconfigured to incorporate new instructional models have been watched closely, with substantial attention paid to assessment of learning gains. Some of these classes make extensive use of educational technology, but the focus is on learning rather than

One especially important experiment in active learning has been the introduction of a new format for introductory physics—TEAL (Technology Enabled Active Learning). TEAL was first implemented for Physics II, the required subject in electromagnetism (8.02). There were three main reasons for adoption of the new format:

1. The traditional formula combining lectures and recitation sections was passive.
2. The absence of laboratories led to a lack of physical intuition among students.
3. Mathematics is inherently abstract and hard to visualize.

Faculty who had taught 8.02 in the classic lecture and recitation format found that while the considerable effort spent in planning, preparing, and practicing lectures might lead to extraordinary feedback from students, academic performance was comparatively disappointing. TEAL was developed in response to this challenge, with funding provided by the d'Arbeloff Fund for Excellence in MIT Education, Project iCampus (the Institute's

educational-technology alliance with Microsoft), and the National Science Foundation. The model drew on the experiences of other institutions with studio-style teaching.

In a TEAL classroom, students work in collaborative groups of nine using desktop experiments linked to networked laptops for data acquisition. Three students of varying ability (one high, one medium, one low) share a laptop. The instructor also utilizes media-rich interactive software for simulations. The instructor typically delivers a lecture on the topic first, and then asks students to answer a multiple-choice conceptual question on hand-held devices, providing immediate feedback on students' answers. The instructor can clarify and reiterate his or her teaching based upon the answers received, allows for discussion among students, and asks them to answer the question again. Once the entire class gets the correct answer, the instructor moves on to the experiment, where the students demonstrate the correct answer.

Feedback from students has been primarily favorable. Studies of all levels of students have shown normalized learning gains to be higher with TEAL classes than in a control group that took the lecture format. The improvement among TEAL students was greatest with respect to conceptual questions, with relatively consistent performance on practical problems. TEAL is still too new to assess students' long-term mastery of the material, but there are plans for such evaluation in the future. Following the success of 8.02 in the TEAL format, the required subject in mechanics (Physics I—8.01) is now also being taught in the TEAL format.

A second closely watched experiment has been "Mission 200X," a problem-based first-year subject in the Department of Earth, Atmospheric, and Planetary Sciences. The class (12.000) provides a multidisciplinary, project-based learning experience, where students work to develop a solution to a deceptively simple problem relating to the Earth's environment. The theme changes each year and is named Mission 200X, where the 200X represents the year in which that year's class will graduate from MIT. Past themes have included devising a method to monitor the wellbeing of the Amazon basin rain forest and developing an environmentally correct strategy for extracting hydrocarbon resources from the Arctic National Wildlife Refuge.

The class grew out of the recommendations of the Educational Design Project to augment the first-year experience by emphasizing the need for cross-disciplinary approaches to solving complex problems. The Committee on the Undergraduate Program adopted the subject as a five-year experiment, featuring an aggressive program of formal evaluation by the Teaching and Learning Lab. Mission 200X is a requirement for students in the Terrascope first-year learning community, but enrollment is not restricted to Terrascope students, and Terrascope itself includes other components.

Each year, the subject's problem to be addressed is divided into ten tasks, which are assigned across ten teams of students. Each team works with one or two upperclass Teaching Fellows who coach participants through the term. The teams are also assigned alumni/ae and disciplinary mentors who provide expertise on various topics as needed.

The subject features four meeting styles: presentations on methodology, case-study discussions, team workshops, and coordination meetings. Each 12.000 participant contributes to the four class deliverables: a personal website documenting the student's research, a team website which serves as an information resource for other teams, a class website describing and justifying the class's proposed solution, and a two-hour presentation before a panel of "experts." The course

has a strong emphasis on teamwork and collaboration, which is reflected in the fact that only 30 percent of the final grade depends upon individual accomplishment.

Student evaluations of 12.000 have been overwhelmingly positive. More than 50 percent of past participants rated the class higher than their other first-semester courses in:

- Providing independent learning opportunities.
- Making them active participants in their education.
- Helping them learn to work productively in a group.
- Providing a sense of accomplishment.

Many students have felt some discomfort with the level of autonomy and responsibility for their own learning inherent in the design. The addition of introductory sessions on the nature of problem solving and the value of teamwork have led to marked improvement in student satisfaction.

TEAL and 12.000 are just two examples of a larger trend to develop pedagogical approaches beyond the traditional "chalk-talk" format. The Teaching and Learning Lab, which reports to the Dean for Undergraduate Education, has been monitoring these developments closely, working closely with instructors to assess both learning gains and student satisfaction. Overall, evaluations of active learning at MIT by the Teaching and Learning Lab have suggested three major findings:

- MIT replicates the findings of other studies in demonstrating that active learning pedagogies enhance conceptual learning.
- All the participants involved in active learning—instructors, teaching assistants, mentors, and students—must be prepared in advance to use active learning effectively.
- Active learning can be more effective for some students than for others and better for teaching some cognitive tasks. Active learning can improve learning gains even in very large classes.

The traditional lecture/recitation format still offers great benefits. Lectures have been shown to be especially effective in giving students the big picture, context, and motivation. New teaching methods are unlikely ever to replace lectures, but they offer an important and sometimes more effective instructional option, and we can anticipate more experiments in active learning at MIT in the future. As it reviews the common educational experiences shared by all undergraduates, the Task Force on the Undergraduate Educational Commons is looking closely at the potential contributions of these new methods.

Undergraduate Professional Opportunities Program

The Undergraduate Professional Opportunities (UPOP) is an important effort to give engineering students exposure to real-world applications early in their undergraduate careers. The name of the program reflects its conceptual affinity with the Undergraduate Research Opportunities Program, MIT's long-running and extremely successful initiative to encourage undergraduate participation in the research carried out at the Institute.

UPOP is sponsored by the School of Engineering and administered through the Office of the Dean of Engineering. Open to all School of Engineering sophomores, this innovative program

aims to provide all engineering students the opportunity to appreciate engineering practice outside the academic context, through activities emphasizing a combination of knowledge, practice, and reflection. UPOP consists of four parts: an intensive one-week engineering practice workshop offered during IAP; extensive pre-employment workshops taught by MIT alumni during the spring; 10 to 12 weeks of meaningful summer employment; and, in the following fall, assessment interviews with staff members and roundtable meetings with other UPOP students, alumni, and faculty to reflect on the summer experience.

The engineering practice workshop, led by faculty from the School of Engineering and the MIT Sloan School of Management, focuses on the realities of engineering practice and emphasizes fundamental abilities: applying technical skills, communication, teamwork, leadership and self-awareness. The curriculum has been designed to be highly interactive, involving students in case studies, simulations, and role-play. Students receive three units of academic credit upon successful completion of the course.

The UPOP Summer Practice Experience allows students to gain experience in the entire job cycle, from recruiting to the actual job experience and is followed by the assessment and reflection process. The UPOP staff helps facilitate the matching of students and employers for 10-12 week internships in traditional and start-up companies, non-profit organizations, and government agencies. Students are required to keep a journal during their internship. Upon completion of the summer practice, both students and employers complete assessments of the summer experience and the program as a whole, and students receive one unit of academic credit. Students are paid directly by their employer companies for the summer internships. The companies do not pay UPOP any fees, and there are no obligations on either side regarding further employment.

UPOP is currently entering the fourth year of a five-year pilot funded by the Deshpande Center for Technological Innovation at MIT. Last year, 181 sophomores from all eight engineering departments participated in the IAP Engineering Practice Workshop. Despite the program's rapid growth, the 2004 recruiting effort led to one or more internship offers for 94 percent of UPOP students; 90 percent participated in internships as part of the Summer Practice Experience.

Cambridge-MIT Student Exchange Program

The Cambridge-MIT Institute (CMI) was established in July 2000 as a strategic alliance between MIT and Cambridge University, with initial funding from the British government. The goals of this unique trans-Atlantic partnership in higher education include research collaborations and the creation of a network in Britain promoting American-style entrepreneurship. Among the programs established by CMI, few have had the impact of the Cambridge-MIT Student Exchange Program.

Much more than a standard "junior year abroad," the program, now administered at MIT through the Office of the Dean for Undergraduate Education, was envisioned as carefully planned and coordinated exercise in international learning. Among its aims was for students from both institutions to absorb key lessons that would enhance their leadership skills. MIT students, it was hoped, would learn how to work well in culturally diverse teams, would have new horizons opened with respect to both their careers and their lives outside the workplace, and would gain the flexibility that comes from succeeding in an academic environment as challenging as the Institute's, but markedly different. Hopes for the Cambridge students were

similar, with the added expectation that some would acquire the entrepreneurial drive that is so deeply engrained in the MIT culture.

The teaching and learning environment at Cambridge is very different from MIT: Cambridge students spend much more of their time learning material without graded problem sets, review sessions, and regular tests, and most students study subjects only in their major department. After four years of operation, twelve MIT departments and nine Cambridge departments are participating in the exchange. More than 110 MIT students have already studied at Cambridge and about the same number of their Cambridge counterparts have spent a year at MIT. In 2003-04, some 35 MIT students are expected to participate in the student exchange.

According to a recent assessment by outside consultants based on personal interviews, many of the MIT participants reported:

- Increased self-confidence, reflecting in part the experience of adjusting to and operating in a very different academic environment;
- An improved ability to learn independently, and at a self-directed pace;
- More self-assurance in interactions with faculty and other mentors, in part because of their experiences in the small-group tutorials that are a key element of the Cambridge system; and
- A broader worldview, along with an enhanced interest in international developments and, for many, in careers with an international dimension.

The evaluation of the exchange was equally positive for the Cambridge participants. Both Cambridge and MIT are now committed to making the program a permanent opportunity for their students.

The exchanges with Cambridge University join a growing number of programs that offer MIT students opportunities to study and learn abroad. As President Charles M. Vest has said, "MIT has long drawn faculty, students, and researchers from all over the globe. Today, however, we realize that we must prepare our own students for lives and careers in a world where major advances in science, technology, and industry frequently occur outside the United States. If our students and faculty are to be lifelong learners and collaborators in knowledge networks with other countries, they need the in-depth understanding of these societies that only the mastery of their language, culture, history, and politics can develop."

The MIT International Science and Technology Initiatives (MISTI) have played a particularly important role in integrating international experience into MIT education. Since 1994, MISTI has placed more than 1,400 MIT students as interns in labs and offices from Beijing to Berlin. Currently MISTI has country programs in China, France, Germany, India, Italy, Japan, and Singapore. Before their departure, interns are trained in the language and culture of the host country. Participants emerge from their stays abroad with the capacity to build enduring professional relationships across national and cultural boundaries. The establishment of the new undergraduate minor program in Applied International Studies, discussed above, reflects in part the success of the MISTI programs.

Graduate Degree Programs

For more than a century, MIT graduate programs have provided ideal environments for advanced study by faculty and students working together to extend the boundaries of knowledge.

The Institute has traditionally been a national leader in engineering graduate education, and its doctoral programs in mathematics and the physical and life sciences have also attained national prominence. In addition, top-ranked graduate programs in economics; political science; linguistics; science, technology, and society; architecture; urban studies; and management have broadened the spectrum of graduate education. The numbers of students in the various graduate programs appear in the data forms appended to this report.

MIT continues to innovate in graduate as well as in undergraduate education. Since the 1999 evaluation for continued accreditation, the Faculty and the Corporation have approved the establishment of seven new graduate degree programs:

- M.Eng. in Biomedical Engineering
  http://web.mit.edu/catalogue/degre.engin.biolo.shtml#grad
- M.Eng. in Materials Science and Engineering
  http://web.mit.edu/catalogue/degre.engin.mater.shtml#grad
- S.M. in Bioengineering—a terminal degree for students not continuing for the Ph.D. in the Biological Engineering Division and the initial MIT graduate degree for certain students entering the Ph.D. program in Medical Engineering and Medical Physics offered by the Harvard-MIT Division of Health Sciences and Technology
- S.M. in Engineering Systems
  http://web.mit.edu/catalogue/degre.engin.engin.shtml#mas
- S.M. in Science Writing
  http://web.mit.edu/catalogue/degre.human.writi.shtml
- Ph.D. in Computational and Systems Biology
  http://web.mit.edu/catalogue/degre.scien.biolo.shtml#gradu
- Ph.D. in Engineering Systems
  http://web.mit.edu/catalogue/degre.engin.engin.shtml#doc

Faculty

The Institute is proud of the sustained excellence of its faculty, as evidenced by continuing recognition for accomplishments in teaching, research, and national service. Over the last five academic years, honors received by members of the faculty have included the Nobel Prize, the National Medal of Science, the Charles Stark Draper Prize of the National Academy of Engineering, the Pulitzer Prize, the MacArthur Fellowship, and the Alan T. Waterman Prize of the National Science Foundation. During the same period, 16 members of the faculty have been elected to the National Academy of Engineering, 15 to the National Academy of Sciences, and 6 to the Institute of Medicine. In the year 2000, the Carnegie Foundation for the Advancement of Teaching and the Council for Advancement and Support of Education named a member of the Mechanical Engineering faculty the State of Massachusetts Professor of the Year.

Most such awards and honors by their nature recognize a long record of accomplishment. Maintaining a tradition of faculty excellence requires the constant intellectual renewal sparked by the arrival on campus of outstanding young faculty, the future leaders in their fields. As of academic year 2003-04, some 38 percent of faculty at all ranks had arrived at MIT since July 1995, and fully 20 percent since July 2000 alone. The Institute seeks to ensure that all members of the faculty receive the support needed to flourish as teachers and scholars, while engaging in a vigorous review process for promotion and tenure as well as appointment.

MIT's commitment to joining education with the creation of knowledge provides a fertile setting for research that continues to spawn scientific breakthroughs and technological advances. Faculty renewal is especially important in ensuring that the Institute continues to be world leader in its chosen fields. Since the 1999 evaluation, members of the faculty have launched major new research initiatives in a number of areas of particular promise and importance:

- Computational and systems biology
  http://csbi.mit.edu/
- The brain and cognitive sciences
  - McGovern Institute for Brain Research
    http://web.mit.edu/mcgovern/
  - Picower Center for Learning and Memory
    http://web.mit.edu/picowercenter/
- Genomic medicine: Broad Institute, a collaboration of MIT, Harvard University and affiliated hospitals, and the Whitehead Institute for Biomedical Research
  http://www.broad.mit.edu/
- Nanotechnology: Institute for Soldier Nanotechnologies
  http://web.mit.edu/isn/
- The relationship between the physical and the information sciences: Center for Bits and Atoms at the MIT Media Laboratory
  http://cba.mit.edu/

For a variety of historical reasons, women, African Americans, Latinos, and Native Americans have long been underrepresented in the science and engineering fields central to MIT as an institution. Strengthening the diversity of the faculty continues to be a key priority for the administration and for the MIT Corporation, whose Visiting Committees are charged to pay particular attention to issues of diversity as they evaluate individual departments and programs.

The Institute's evaluation for continued accreditation in 1999 followed shortly upon the public release of a report on a study of the status of women in the School of Science—a study that became a national and international model for similar efforts at other research institutions. In response to the findings of the study, MIT took prompt action to redress inequities stemming from gender bias.

The study in the School of Science found that tenured women faculty often experienced marginalization, and with it inequities in research resources and compensation—inequities that can be difficult to detect in the absence of systematic study. To ensure the equitable treatment of

women faculty, the Provost asked that studies similar to that in the School of Science be undertaken in the Institute's four other Schools. Committees on the status of women faculty, appointed by the Deans, developed study models appropriate to each School's unique structure and culture, analyzed data and conducted interviews, and prepared reports on their findings.

These studies were all complete by spring 2002. Strikingly, they revealed that the issues that can negatively impact the professional lives of women faculty were similar in different Schools and similar to those identified in Science. They included marginalization, which can sometimes be accompanied by inequities; the small number of women faculty in many departments; and the greater difficulty of balancing family and work experienced by women faculty. Despite generic similarities, specific manifestations of these problems differed among Schools, and even in different departments within a School. Identification of the specific concerns of women faculty led to prompt corrective actions—especially important since the studies revealed the extreme frustration and discouragement that can result from a feeling that there may be inequities in the system.

Realizing that inequities will probably continue to arise and impact the productivity and quality of life for women faculty, the Provost and President requested that the committees on women faculty remain in place and continue to monitor equity, including annual reviews of primary salary data by Committee chairs.

As President Vest has noted, important though it is, "fixing inequities is the easy part" of the solution. The more difficult part is to understand the reasons inequities arise, and the reasons for marginalization and for the small number of women and minority faculty, and to address them. In recognition of the complexity of these problems, the President and Provost established a Council on Faculty Diversity in the fall of 2000. This administrative mechanism allows faculty with knowledge of an important issue to work hand in hand with administrators who have both a deep knowledge of institutional process and the power to impact it rapidly.

The Council is currently co-chaired by the Provost, Professor Nancy Hopkins of the Department of Biology, and Professor Wesley L. Harris of the Department of Aeronautics and Astronautics. As co-chair of the Council on Faculty Diversity. Professor Hopkins is a member of the Academic Council, which serves as the President's cabinet, bringing together senior officers concerned with the overall administration of the Institute and the elected Chair of the Faculty to confer on matters of Institute policy.

The Council considers all aspects of faculty development:

- Tracking the number of women and minority students through undergraduate and graduate schools, to post-doctoral associate positions, and finally to faculty positions.
- Designing programs and policies to increase their number and to promote retention.
- Examining policies and processes for faculty hiring within MIT, and making recommendations on how to improve faculty searches and recruitment of women and minority candidates.
- Creating programs and policies that are sensitive to the need to balance an academic career with a family life.
- Establishing an open and inclusive environment for a diverse faculty that promotes involvement in leadership throughout MIT.

One important issue that the Council on Faculty Diversity Faculty addressed early in its existence was the role that institutional policy could play in helping members of the faculty—especially but not only women—balance the needs of work and family. In December 2001 Academic Council approved a group of new policies facilitating family care by members of the faculty that had been developed by the Council on Faculty Diversity. These policies seek to help Institute faculty have productive careers and still meet their family responsibilities. Since family care takes different forms at different ages and different family constellations, the policies take these differences into account:

- Parental support: A faculty member who wishes to spend the majority of his or her time on the care of and responsibility for a newborn child or a newly adopted child will be released from teaching and administrative duties for one semester at full pay. Faculty members on such release are expected to fulfill their thesis advising responsibilities and sustain their research program.
- Extension of the tenure clock for childbearing: In recognition of the effects that pregnancy and childbirth can have on a woman's ability to perform all the tasks necessary and expected to achieve tenure, a woman who bears one or more children during her tenure probationary period will have that period extended by one year. As in all tenure cases, a tenure review can take place prior to the end of the probationary period and that possibility should be assessed annually. In recognition of the time and energy that adoption can take, adoptive parents (both male and female) may also request such an extension from the Provost, as may a faculty member whose partner has borne a child.
- Part-time appointment with tenure for family care: Tenured faculty who need time for care of children, partners, or elders normally may have a reduced time, reduced pay appointment for a period from one semester up to five years (with possible renewal) in order to allow them the time needed for the care of family.

Implementation and monitoring of the policies are the responsibility of a subcommittee of the Council on Faculty Diversity.

In recent years, the Institute has appointed women members of the faculty to key positions in academic and research leadership. Six women now sit on the 22-member Academic Council in addition to the Co-Chair of the Council on Faculty Diversity—the Vice President for Research and Associate Provost, the Dean of the School of Architecture and Planning, the Director of the Libraries, and three vice presidents in administrative areas. A woman serves as Associate Dean of the School of Architecture and Planning, and women now lead the Department of Earth, Atmospheric, and Planetary Sciences; the Technology and Policy Program; the Center for Environmental Health Sciences; the Laboratory for Nuclear Science; and the Center for Space Research. Across MIT, a growing number of women are serving in leadership roles within their units, particularly as Associate Department Heads.

In addition to these Institute-wide initiatives, individual Schools have developed their own programs and processes to strengthen faculty diversity. Initiatives in the School of Engineering provide some examples. A new Office of Faculty Diversity Searches is dedicated to recruiting and retaining a talented and diverse engineering faculty across the School, and every search committee in the School must provide application material for all women and minority candidates to the Dean. (Candidates are also reviewed by a departmental faculty search committee that includes a woman and an underrepresented minority faculty member or, if the

committee lacks a woman or underrepresented minority faculty member, by a School-based Minority Faculty Recruitment and Retention Committee.) New processes are also in place within individual departments. The Department of Mechanical Engineering, for example, has created a centralized committee to oversee and serve as a resource to the targeted search committees. It also reviews women and minority applications so that it can share candidates with multidisciplinary qualifications across the department's searches.

Even as MIT has built diversity and success at the undergraduate level, it has become clear that improvement in undergraduate enrollment simply does not easily or automatically translate into progress at the graduate and faculty levels. There have been real gains, especially with respect to women faculty. For the ten years beginning in 1983 the proportion of women on the faculty rose only slightly, from 9 to 11 percent. (At the same time, the number of women students was increasing, evidence of a leaky pipeline.) By 2003-04, however, the overall percentage of women faculty had increased to 17 percent. Although the representation of women on the Sloan School faculty grew only slightly over the last ten years (from 16 to 17 percent), the proportion of women faculty jumped in the other four Schools—from 7 to 13 percent in Engineering, 8 to 13 percent in Science, 22 to 30 percent in Architecture and Planning, and 24 to 29 percent in the Humanities, Arts, and Social Sciences. It has proven much harder to increase minority representation: The proportion of underrepresented minorities on the MIT faculty in 2003-04 was 4 percent, up only slightly from 1990, when it stood at just under 3 percent.

The Faculty itself has endorsed the Institute's many recent initiatives in support of faculty diversity and seeks to extend their reach, having made a commitment in May 2004 "to taking a leadership position among our peer institutions in the recruiting and success of underrepresented minority faculty and graduate students." The Faculty resolution, adopted unanimously, also "urges the provost, academic deans, dean of graduate education and department heads to take all necessary and sufficient steps to increase the percent of underrepresented minority faculty by roughly a factor of two within a decade…" The resolution urges the MIT leadership to use identical methods to increase the percentage of underrepresented minority graduate students by roughly a factor of three within a decade.

The Faculty also asked the Provost to "provide guidance and direction as requested by the departments, including examples of best practices around the country, in order to achieve these goals." According to terms of the resolution, the Faculty, the Faculty Policy Committee, and the Council on Faculty Diversity anticipate annual reports measuring the progress of the recruitment process—including the recruitment of women—by School, department, and laboratory. Strengthening the diversity of the MIT faculty has not been, and will not be, easy, but it is vital to the future of the university and will continue to be an institutional priority.

Financial Resources

MIT's financial resources remain strong: as of June 30, 2003, the latest date for which audited figures are currently available, the Treasurer reported that total net assets stood at $6,930.6 million. The Institute continues to be one of only a small number of private research universities whose bonds are rated AAA. Research funding from government, industry, and foundations has grown strongly in recent years.

In June 2004, the MIT Corporation approved the establishment of the MIT Investment Management Company as a division of the Institute to supervise and manage the Institute's endowment. The new structure is intended to allow the Institute to draw on as broad a pool of expertise as possible in the management of its investments. With the establishment of the Investment Management Company, the existing Investment Committee of the MIT Corporation was suspended. The organization adopted ensures continuing trustee oversight: the Directors of the Company are appointed by the Executive Committee of the Corporation, and a majority must be members of the Corporation. The Chairman of the Corporation, MIT's President, and the Treasurer of the Corporation all serve as Directors ex officio.

The economic downturn that began in the year 2000 affected MIT, as it did many other private institutions, most notably through reduced distributions from the endowment. In response to the resulting imbalance between revenues and expenditures, campus operating budgets saw reductions for Fiscal Years 2004 and 2005, while the salaries of faculty and staff earning more than $55,000 were frozen for Fiscal Year 2005. Specific budget decisions respected the mission and core values of the Institute. As Institute President Charles M. Vest said in fall 2003, "Our stewardship of MIT during this time, as always, must support the value and uniqueness of an MIT undergraduate education, the excellence that we have achieved in graduate education and research, and the rich intellectual, racial, and cultural diversity of our campus." Student life programs for undergraduate and graduate students were largely protected from changes to the budget.

Despite the need for some staff layoffs as a result of targeted budget reductions, morale on campus remained relatively high during academic year 2003-04, buoyed by widespread awareness that the quality of the Institute's teaching and research had never been higher. Budgets for Fiscal Year 2005 were structured to ensure that additional cuts would not be necessary going forward, and MIT remains well positioned to maintain the excellence of its programs.

In November 1999, the Institute launched a capital campaign entitled *Calculated Risks, Creative Revolutions: The Campaign for MIT* (http://web.mit.edu/giving). When the campaign's original goal of $1.5 billion was met nearly two years ahead of schedule in summer 2002, MIT increased the goal. The current target, $2 billion, reflects a special focus on enhanced support for graduate and undergraduate students, improving academic and non-academic environments for learning, and capital construction.

The specific goals of the campaign include:

- Creating or expanding research and educational activities in such areas as the brain and cognitive sciences, biological engineering, the environment, and public understanding of science and technology;
- Enhancing MIT's learning environment through initiatives such as teaching innovations and extensively wired classrooms, together with improvements in key areas of student life such as athletics, public service, and programs based in student residences; and
- Renewing the physical campus, as discussed in section on physical resources above.

The campaign has had a marked impact on MIT. Its most visible manifestations have been new facilities such as Simmons Hall, the Stata Center, and the Zesiger Center, but other important

advances it has made possible include increases in support for scholarships and fellowships and the extension of programs in such areas as research internships abroad and hands-on learning opportunities. By late summer 2004 the campaign total had reached more than $1.95 billion.

During the last decade, the Institute has by design become less dependent on federal research funding to support campus operations, relying more heavily than in the past on private sources of support, including gifts and investment income. The Campaign for MIT marks an important step in this ongoing transformation of MIT's financial structure. The striking success of the campaign, against the backdrop of a difficult economic and philanthropic climate, is cause for optimism that the Institute's graduates and friends will continue their support in the years ahead.

ENHANCING INSTITUTIONAL EFFECTIVENESS

MIT's commitment to excellence entails rigorous self-assessment of current programs and careful planning for the future. Efforts to enhance institutional effectiveness take place at many levels and in many contexts.

Self-assessment is an ongoing priority for MIT as an institution and for its individual academic programs and student services. The 31 Visiting Committees of the Corporation, each of which meets every two years, continue to have a strong influence on the course of education and research at the Institute. In recent years, Committee chairs have been asked to consult annually with departments and provide interim status reports to their fellow members to supplement the biennial visits. The Visiting Committees serve as strong advocates and sounding boards for strategic planning initiatives in units across the Institute.

Since its establishment in 1997 the Teaching and Learning Laboratory (TLL) has played an increasingly important role in assessing and improving teaching. Reporting to the Dean for Undergraduate Education, TLL works to strengthen the quality of instruction at the Institute; to better understand the process of learning in science and engineering; conduct research that has immediate applications both inside and outside the classroom; to serve as a clearinghouse to disseminate information on efforts in science and engineering education nationally and internationally; and to aid in the creation of new and innovative educational curricula, pedagogical methods, technologies, and methods of assessment. Because the job of improving teaching and learning at MIT cannot fall to any one group, TLL works in cooperation with many other parts of the Institute. It has created alliances with Academic Computing, Academic Media Production Services, the Alumni/ae Association, the Committee on the Undergraduate Program, the Council on Educational Technology, the Office of Academic Services, and the MIT Careers Office.

While ongoing systems of assessment are essential to the health of the institution, so too are occasional large-scale efforts to take stock and chart new directions. In 2003, the Institute launched a particularly important assessment of the educational experiences that all MIT undergraduates have in common—the Task Force on the MIT Undergraduate Educational Commons, which began its work in December 2003 and includes faculty and students. The work of this group will build on the work of the Institute-wide Task Force on Student Life and Learning, whose 1998 report formed the basis of MIT's institutional self-study during its 1999 evaluation for continued accreditation.

In explaining his decision to charter the Task Force on the Undergraduate Educational Commons, MIT President Charles M. Vest said, "Our students study in a campus community of rich diversity in every dimension, and graduate to work and lead in a global society. They follow career paths (some of which are very different from those followed by our graduates only a few decades ago) that often call for an understanding of many cultures and intellectual traditions. It is time for MIT to reflect on its undergraduate education given this context, the ever-increasing centrality of science and engineering to our world, the changing demography of our students, and the advance of pedagogy and learning methods. In particular, we must review and affirm the future course of our undergraduate educational commons--those

experiences of learning and discovery that all our students share in common, and that give basic definition to an MIT education."

The Task Force on the Undergraduate Educational Commons will review MIT's core educational requirements as well as other aspects of the undergraduate experience that are common to all MIT students. The group, chaired by Class of 1942 Professor of Chemistry and Dean of Science Robert Silbey, was asked to report its findings and recommendations to the Faculty within two years. Professor Silbey co-chaired the Task Force on Student Life and Learning that reported in 1998. The associate chairs of the new task force are Professors Kip Hodges of Earth, Atmospheric, and Planetary Sciences; Dava Newman of Aeronautics and Astronautics; and Charles Stewart of Political Science, Associate Dean of the School of Humanities, Arts, and Social Sciences.

The Institute's current educational mission statement, developed by the Task Force on Student Life and Learning, states that, "The Massachusetts Institute of Technology is devoted to the advancement of knowledge and education of students in areas that contribute to or prosper in an environment of science and technology. Its mission is to contribute to society through excellence in education, research, and public service, drawing on core strengths in science, engineering, architecture, humanities and social sciences, and management. This mission is accomplished by an educational program combining rigorous academic study and the excitement of research with the support and intellectual stimulation of a diverse campus community."

The Task Force on the MIT Undergraduate Educational Commons has been asked to:

- Review MIT's educational mission statement, including its supporting educational and societal context, and then reaffirm or modify the statement as appropriate.
- Derive from the educational mission a specific set of goals for the education of all undergraduates.
- Develop common curriculum requirements for all undergraduates.
- Develop and recommend to the faculty the formal structure of the undergraduate curriculum, expressed in a set of General Institute Requirements (GIRs) or an alternative.

MIT is one of the few American colleges and universities with extensive common curricular requirements for all its students. The 17-subject GIRs evolved over the past 50 years, although the basic structure of these requirements has remained much the same. All undergraduates are expected to take specific subjects in biology, chemistry, physics, and mathematics as well as at least one subject in the humanities, arts, and social sciences each term. A semester of molecular biology was added to the GIRs in 1991. Most recently, the faculty approved the establishment of a communication requirement (discussed in the section above on major institutional changes since 1999 above) to provide additional writing and speaking experience.

In addition to the GIRs, the educational commons at MIT includes activities such as UROP (the Undergraduate Research Opportunities Program) that, while not required, are considered by most faculty and students to be important components of MIT undergraduate education.

Professor of Physics and Dean for Undergraduate Education Robert P. Redwine presented the case for a review of the undergraduate educational commons at a meeting of the MIT Faculty in September 2003. He recommended that the review consider students' changing intellectual and societal interests, and that it address concerns within some academic departments about the current scope and content of the core requirements and a general desire among faculty to broaden the exposure of entering students to the range of options available to them at MIT. Among the faculty, there is "strong consensus that an MIT undergraduate education must continue to provide a deep, common grounding in science and math," Redwine said. "We are not trying to fix something that is broken." However, he added, "today's MIT students have experiences and interests that are different in important ways from those of students in decades past." Redwine said faculty members have discussed questions with him such as: How can we broaden students' exposure to engineering during their first year? To what extent should the GIRs promote cultural literacy and to what extent should they be a foundation for further study in a major? How can we help students explore the full range of opportunities at MIT?

The Task Force met for the first time in January 2004 to establish its agenda for the next six months. Members spent the spring term developing a common and comprehensive understanding of what MIT students learn and how they learn it. As its work progresses, the Task Force will seek input from the entire MIT community, including alumni/ae, as well as perspectives and advice of the appropriate committees of the Faculty, particularly the Committee on Curricula and the Committee on the Undergraduate Program. Members also will gather information from outside MIT, including other colleges and universities, graduate and professional schools attended by MIT graduates, and employers who hire MIT students.

During the spring semester, the Task Force gathered background information on MIT's current set of common curricular requirements and its undergraduates. Members met regularly and heard from faculty with oversight of various portions of the current General Institute Requirements, including:

- Science core subjects (physics, mathematics, chemistry, and biology);
- Humanities, arts, and social sciences requirement;
- Restricted electives in science and technology requirement;
- Communication requirement; and
- Institute laboratory requirement.

The group also met with Marilee Jones, MIT Dean of Admissions, who presented a profile of MIT students and applicants and provided insight into how this population has changed over time. The Task Force reviewed statistical data and surveys that shed light on student enrollment patterns and opinions on the GIRs. Outside of these meetings, one or more members of the Task Force met with the following groups to review its charge and overall plan as well as to hear suggestions about issues and areas to consider:

- Margaret MacVicar Faculty Fellows.
- Departmental Faculty Undergraduate Officers.
- Engineering Committee on Undergraduate Education.
- Corporation Visiting Committee for the Office of the Dean for Undergraduate Education.

The student members of the Task Force began outreach to the student community with a forum open to the entire community and two roundtable discussions for students who expressed interest in actively participating in the work of the Task Force. The student members reported regularly to the Task Force on the input provided at these events.

The Task Force concluded the semester by meeting intensively during the second week of June. During their workweek, members reviewed what they had learned to date, reviewed the findings and recommendations of the 1998 Task Force on Student Life and Learning and the reports of other earlier faculty committees, and began formulating a revised set of educational principles for MIT undergraduate education. A number of important educational themes emerged during their discussions, and by the end of the workweek the Task Force had condensed these themes into five major areas:

- Leadership, innovation, and creativity.
- Scientific and technical fundamentals.
- Social responsibility, ethics, and science, technology, and society.
- Fundamental modes of analysis.
- Rethinking learning at MIT.

Task Force working groups are spending the summer months articulating the opportunities and challenges in each of these areas and developing recommendations for ways to improve MIT education and the common undergraduate experience. When the Task Force reconvenes as a whole in the fall, it will expand its reach to the MIT community by creating a Student Advisory Committee, interacting with alumni/ae through such events as the Alumni Leadership Conference, and engaging additional faculty members to contribute to subcommittee work.

Additional information on the Task Force on the Undergraduate Educational Commons is available online at http://web.mit.edu/committees/edcommons/.

SUMMARY APPRAISAL AND PLANS

This report has sought to convey a sense of the excitement at the Massachusetts Institute of Technology during a particularly vibrant period in its development. Institute President Charles M. Vest has often suggested that this is the most exciting time for science and its applications in all of history. At such a moment, MIT, with its great strengths in science and engineering and its robust tradition of interdisciplinary study and research, can play a unique role in advancing teaching and research. Developments since the Institute's evaluation for continued accreditation in 1999 have laid the groundwork for sustained excellence.

The last five years have seen some long-awaited projects come to completion, and the launch of important new initiatives in student life, instruction, and research. This report has focused on some of the period's outstanding accomplishments:

- Building on the work of the Task Force on Student Life and Learning that reported in 1998, the Institute has strengthened the residential and campus community for undergraduates and graduate students along multiple dimensions. The transition to housing all first-year undergraduates in campus residence halls has been accompanied by innovations in advising and a greater attention to the shape of the first year as a whole. At the same time, MIT remains committed to a diversity of undergraduate residential options and to a strong array of fraternities, sororities, and independent living groups. New facilities have strengthened community on campus and broadened fitness activities and athletic participation. Students have a wider array of opportunities to develop leadership skills and engage in substantive public service.

- The Institute has strengthened the scholarly resources available to faculty and students, building digital library collections that match in depth and sophistication its historically strong print collections. Moreover, the Libraries have begun to play a leading role in the larger issues facing digital repositories. Needed investments in current facilities have gone hand in hand with the development of exciting plans for the future.

- MIT's capital construction program has created a vibrant, newly energized academic campus and residential community. While commissioning bold new buildings, the Institute has also invested substantially in less visible projects, renovating its historic structures and putting in place the infrastructure needed to support twenty-first-century operations. MIT is now looking toward the comprehensive revitalization of its historic "Main Group," so that it can remain the vital heart of the campus for another century to come.

- MIT has not sought to launch a mass-market distance education enterprise, but has built on its history of leadership in educational technology to launch a small number of high-impact initiatives aligned with its mission and core values. The System Design and Management program and the Singapore-MIT Alliance model sophisticated forms of synchronous instruction at a distance. At the same time, MIT OpenCourseWare takes advantage of the Web to offer the Institute's basic teaching materials to the world—free of charge. All of these initiatives strengthen education on campus.

- Undergraduate and graduate programs have continued to evolve to meet student needs and explore new intellectual frontiers. A groundswell of educational innovation is enlivening undergraduate instruction and offers students new opportunities for intellectual and personal growth outside the classroom and laboratory. Active learning structures an increasing number of classes, including some important Institute requirements. The Undergraduate Professional Opportunities Program exposes engineering students to the world of practice early in their professional development, while student exchanges with Cambridge University offer juniors the chance to learn in an environment very different from MIT's, though no less rigorous.

- The strength of the Institute's programs of teaching and research depends necessarily on the excellence of MIT's faculty; faculty renewal has helped the Institute establish outstanding new programs of teaching and research in important emerging fields. Going forward, MIT seeks to build a more diverse faculty. This effort can build on demonstrated accomplishments in recruiting, mentoring, and advancing women faculty—evidence that focused institutional commitment can make a difference.

- Helped by the notable success of an ambitious capital campaign, the Institute has continued to move toward a financial model that reduces its reliance on federal research spending. Like other nonprofit institutions, MIT has felt the effects of an uncertain economy, but the Administration was able to develop tighter budgets with great goodwill on the part of faculty and staff alike. The Institute is now well positioned to move forward from a position of financial strength.

- The continued excellence of education at MIT depends on regular intellectual and pedagogical renewal. As this report has demonstrated, the members of the Institute's faculty are enthusiastic about the development of educational programs in emerging areas and the introduction of new teaching methods. But incremental change alone, however exciting, cannot ensure that the curriculum evolves in appropriate directions. The establishment of the Task Force on the Undergraduate Educational Commons represents a major commitment on the part of the Institute to enhancing the effectiveness of MIT education.

Going forward, it is clear that sustaining the excellence of its educational programs will continue to be MIT's highest priority. The Task Force on the Undergraduate Educational Commons will play a crucial role in ensuring that the Institute's undergraduate program remains relevant, rigorous, and fulfilling. It will also complete a comprehensive reassessment of MIT education for a new era. That process was begun by the Task Force on Student Life and Learning, which identified academics, research, and community as the three indispensable components of education at the Institute. Focused attention to student life and learning has greatly strengthened the residential and campus community over the last few years, but this will remain an ongoing commitment, and an essential complement to innovation in the classroom, laboratory, and curriculum.

New presidential leadership will inevitably affect the direction of change at MIT in the coming years. The broadly consultative presidential search process has already offered many segments of the Institute community an opportunity to think about their priorities and aspirations. The transition ahead will offer MIT a chance to assess its course so that it can best build on its recent accomplishments.

CIHE DATA FORMS

GENERAL INFORMATION

Institution Name:	Massachusetts Institute of Technology		
FICE Code:	2178		
Carnegie Classification:	Research Intensive		
		Certified: Yes / No	Qualified / Unqualified
Financial Results for Year Ending:	06/30		
Most Recent Year	2003	Yes	Unqualified
1 Year Prior	2002	Yes	Unqualified
2 Years Prior	2001	Yes	Unqualified
Budget / Plans			
Current Year	2004		
Next Year	2005		
Contact Person:	Lydia S. Snover		
Title:	Assitant to the Provost for Institutional Research		
Telephone No:	617-253-5838		
E-mail address	lsnover@mit.edu		

*WHEN ENTERING FINANCIAL DATA ON SUBSEQUENT FORMS,
PLEASE ROUND TO THE NEAREST THOUSAND

STATEMENT OF FINANCIAL POSITION

Massachusetts Institute of Technology	2001 2 Years Prior 2001	1 Year Prior 2002	Most Recent Year 2003	Percent Change 2002 2001	Percent Change 2003 2002
Audited:	Yes	Yes	Yes		
ASSETS					
Cash & Short Term Investments	410,766	489,775	417,152	19.2%	-14.8%
Accounts Receivable, Net	107,849	140,374	131,886	30.2%	-6.0%
Contributions Receivable, Net	303,047	339,345	402,741	12.0%	18.7%
Inventory & Prepaid Expenses	75,112	110,398	146,338	47.0%	32.6%
Long-Term Investments	6,970,563	5,866,549	5,669,965	-15.8%	-3.4%
Loans to Students	81,217	80,048	76,778	-1.4%	-4.1%
Funds held under Bond Agreement	-	159,028	110,560	-	-30.5%
Land, Building & Equipment, Net	882,651	1,172,731	1,365,470	32.9%	16.4%
Other Assets	44,812	29,176	30,516	-34.9%	4.6%
Total Assets	8,876,017	8,387,424	8,351,406	-5.5%	-0.4%
LIABILITIES					
Accounts Payable & Accrued Liabilities	208,311	231,920	226,686	11.3%	-2.3%
Deferred Revenue & Refundable Advances	23,540	30,402	26,450	29.2%	-13.0%
Annuity & Life Income Obligations	81,594	79,975	83,868	-2.0%	4.9%
Amounts Held on Behalf of Others	153,340	159,467	139,891	4.0%	-12.3%
Long Term Debt	522,456	772,034	912,135	47.8%	18.1%
Refundable Gov't Advances	30,887	31,444	31,751	1.8%	1.0%
Other Long-Term Liabilities				-	-
Total Liabilities	1,020,128	1,305,242	1,420,781	27.9%	8.9%
NET ASSETS					
Unrestricted					
Avail for Operations, Plant & Other Trustee Designated Purposes				-	-
Accum. Gains & Losses (associated with Permanent Endowment)	2,787,919	2,488,481	2,321,637	-10.7%	-6.7%
Designated for Long-Term Investments				-	-
Net Investment in Plant	294,242	338,346	375,452	15.0%	11.0%
Total Unrestricted Net Assets	3,082,161	2,826,827	2,697,089	-8.3%	-4.6%
Temporarily Restricted					
Available for Operations				-	-
Accum. Gains & Losses	3,466,303	2,888,856	2,530,409	-16.7%	-12.4%
Designated for Long-Term Investments	88,883	87,481	351,087	-1.6%	301.3%
Total Temporarily Restricted Net Assets	3,555,186	2,976,337	2,881,496	-16.3%	-3.2%
Permanently Restricted Net Assets					
Total Permanently Restricted Net Assets	1,218,542	1,279,018	1,352,040	5.0%	5.7%
Total Net Assets	7,855,889	7,082,182	6,930,625	-9.8%	-2.1%
				-	-
TOTAL LIABILITES & NET ASSETS	8,876,017	8,387,424	8,351,406	-5.5%	-0.4%

STATEMENT OF UNRESTRICTED REVENUES AND EXPENSES

Massachusetts Institute of Technology	2 Years Prior	1 Year Prior	Most Recent Year	Current Year Budget
	2001	2002	2003	2004
Audited:	Yes	Yes	Yes	
FROM OPERATIONS				
Revenue				
Tuition & Fees	290,835	297,924	322,525	331,670
Less: Financial Aid	129,804	144,085	154,692	165,400
Net Tuition & Fees Revenue	161,031	153,839	167,833	166,270
Gov't Appropriations				-
Contributions used in Operations (1)	102,171	78,676	76,380	89,000
Endowment Income used in Operations	251,447	295,231	289,822	327,800
Federal & State Student Aid				-
Gov't & Private Sponsored Research	758,825	811,112	892,405	915,900
Other Income				81,100
Auxiliary Enterprises	63,851	63,303	71,797	77,800
Sales & Services of Educ. Activities	115,589	166,967	134,723	60,000
Independent Operations				-
Total Revenues	1,452,914	1,569,128	1,632,960	1,717,870
Net Assets Released from Restrictions	12,048	23,586	25,083	35,000
Total Revenues & Net Assets Release	1,464,962	1,592,714	1,658,043	1,752,870
Expenses				
Instruction	286,504	311,873	328,345	357,575
Research	628,629	699,509	754,519	755,800
Public Service	298	273	402	438
Academic Services	152,316	177,761	162,490	176,955
Student Services	50,126	55,509	50,453	54,945
Institutional Support	190,495	206,892	302,277	329,187
Other Expenses				-
Total Education & General Expenses	1,308,368	1,451,817	1,598,486	1,674,900
Auxiliary Enterprises	76,740	84,132	88,087	92,800
Independent Operations				-
Total Expenses	1,385,108	1,535,949	1,686,573	1,767,700
Increase (Decrease) in Net Assets from Operations	79,854	56,765	(28,530)	(14,830)
NON OPERATING				
Gifts, Bequests & Contributions not used in Operations				
Restricted Equipment Purchases				
Reinvested Gains & Losses & Income from Investments	(185,516)	(351,053)	(58,067)	
Gains & Losses on Disposal of Property				
Other revenues and expenses, Net	15,035	38,954	(43,141)	
Increase (Decrease) in Net Assets from NonOperating Activity	(170,481)	(312,099)	(101,208)	
Increase (Decrease) in Unrestricted Net Asset	(90,627)	(255,334)	(129,738)	

Footnote:

(1) Includes receivables of:

☐ Check This Box if you have allocated a portion of Institutional Expenditures to other expense lines.

STATEMENT OF CHANGES IN NET ASSETS

Massachusetts Institute of Technology	2 Years Prior	1 Year Prior	Most Recent Year
	2001	2002	2003
Audited:	Yes	Yes	Yes
Increase (Decr) in Unrestricted Net Assets	(90,627)	(255,334)	(129,738)
Changes in Temporarily Restricted Net Assets:			
Contributions (1)	38,918	85,800	103,180
Reinvested Endowment Income & Gains	(291,993)	(599,618)	(98,411)
Net Assets Released from Restrictions	(21,526)	(52,884)	931
Other	(3,444)	(12,147)	(100,541)
Increase in Temporarily Restricted Net Assets	(278,045)	(578,849)	(94,841)
Changes in Permanently Restricted Net Assets:			
Contributions (2)	66,118	72,104	57,503
Reinvested Endowment Income & Gains	3,950	(14,858)	(3,506)
Other	(1,432)	3,230	19,025
Increase in Permanently Restricted Net Assets	68,636	60,476	73,022
Increase (Decrease) in Total Net Assets	(300,036)	(773,707)	(151,557)
Net Net Assets at Beginning of Year	8,155,925	7,855,889	7,082,182
Net Net Assets at End of Year	7,855,889	7,082,182	6,930,625

Footnote:

(1) Includes receivables of:	118,885	181,172	223,872
(2) Includes receivables of:	184,162	158,173	178,868

SUPPLEMENTAL DATA

Massachusetts Institute of Technology	2 Years Prior 2001	1 Year Prior 2002	Most Recent Year 2003	Current Year Budget 2004
SECTION 1: FINANCIAL AID				
Source of Funds:				
a) Unrestricted Institutional	88,075	93,729	102,405	111,700
b) Federal, State & Private Grants				
c) Restricted Endowment Funds	41,729	50,356	52,287	53,700
TOTAL	129,804	144,085	154,692	165,400
% Discount of Tuition & Fees	44.6%	48.4%	48.0%	49.9%
% Unrestricted Discount	30.3%	31.5%	31.8%	33.7%

SECTION 2: CONTRIBUTIONS RECEIVABLE (most recent year)	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
less than 1 year		68,288	38,457	106,745
1 year or greater		207,316	246,388	453,704
less: allowance		22,000	23,000	45,000
less: discount to present value		29,732	82,976	112,708
Total Contributions Receivable	0	223,872	178,869	402,741

SECTION 3: ENDOWMENT INCOME USED IN OPERATIONS (most recent year)	Formula:	Most Recent Yr. Amount 2003
Please check source of funding:		
☑ Spending Policy	based on 36 month average of lagging endowment market value	150,109
☐ Interest & Divideneds Only		139,713
☐ Unrealized Gains & Losses		
Total Endowment income Used in Operations		289,822

SECTION 4: INSTITUTIONAL SUPPORT COST ADJUSTMENTS (most recent year)	
Cost reported on CIHE Form 2	302,277
Add: costs previously allocated:	
Auxiliary Services	
Independent Operations	
Sales & Services of Educ. Activities	
Other	
Total Institutional Support Costs	302,277
% of Total Revenues & Net Assets Released from Restrictions	18.2%

SECTION 5: FACILITY COST ALLOCATIONS (most recent year) Breakout costs allocacated to all lines on CIHE Form 2-1.	2 Years Prior 2001	1 Year Prior 2002	Most Recent Year 2003	Current Year 2004
Operations & Maintenance	95,853	91,048	67,954	
Depreciation & Amortization	61,580	65,142	82,176	
Interest Expense	14,661	14,398	26,152	
Total Facility Costs	172,094	170,588	176,282	0
Percent of Total Revenues & Net Assets Released from Restrictions				
Operations & Maintenance	6.5%	5.7%	4.1%	0.0%
Depreciation & Amortization	4.2%	4.1%	5.0%	0.0%
Interest Expense	1.0%	0.9%	1.6%	0.0%
Total Facility Costs	11.7%	10.7%	10.6%	0.0%

STATEMENT OF UNRESTRICTED OPERATING REVENUES AND EXPENSES

Massachusetts Institute of Technology	Most Recent Year 2003	Most Recent Budget 2003	Current Year Budget 2004	Next Year Forward 2005	Two Years Forward 2006
FROM OPERATIONS					
Revenue					
Tuition & Fees	322,525		331,670	350,160	
Less: Financial Aid	154,692		165,400	163,840	
Net Tuition & Fees Revenue	167,833	0	166,270	186,320	0
Gov't Appropriations	0		0	-	
Contributions used in Operations (1)	76,380		89,000	89,000	
Endowment Income used in Operations	289,822		327,800	303,100	
Federal & State Student Aid	0		0	-	
Gov't & Private Sponsored Research	892,405		915,900	1,109,200	
Other Income			81,100	90,000	
Auxiliary Enterprises	71,797		77,800	82,200	
Sales & Services of Educ. Activities	134,723		60,000	62,500	
Independent Operations	0		0	-	
Total Revenues	1,632,960	-	1,717,870	1,922,320	-
Net Assets Released from Restrictions	25,083		35,000		
Total Revenues & Net Assets Release	1,658,043	-	1,752,870	1,922,320	-
Expenses					
Instruction	328,345		357,575	369,286	
Research	754,519		755,800	924,700	
Public Service	402		438	452	
Academic Services	162,490		176,955	182,751	
Student Services	50,453		54,945	56,744	
Institutional Support	302,277		329,187	339,967	
Other Expense	0		0	-	
Toal Education & General Expenses	1,598,486	-	1,674,900	1,873,900	-
Auxiliary Enterprises	88,087		92,800	92,200	
Independent Operations	0		0	-	
Total Expenses	1,686,573	-	1,767,700	1,966,100	-
Increase (Decrease) in Net Assets from Operations	(28,530)	-	(14,830)	(43,780)	-
Footnote:					
(1) Includes receivables of:	0		0		
Tuition and Mandatory Fee Charges					
Tuition and Fee Discount	45%	48%	48%	50%	

STATEMENT OF CAPITAL CASH FLOWS

Massachusetts Institute of Technology	2 Years Prior 2001	1 Year Prior 2002	Most Recent Year 2003	Current Year Budget 2004	Next Year Forward 2005
SOURCES OF FUNDS:					
Cash flow from Depreciation					
Cash from Gifts/Grants	37,790	65,528	72,801	81,489	
Debt Proceeds	254,600	258,504	204,628	150,854	
Other	19,085	17,208	11,375	12,567	
Total Sources	311,475	341,240	288,804	244,910	-
USES OF FUNDS					
Renovation & Maintenance	2,744	2,475	2,050	3,522	
Space Alterations	8,418	9,797	3,384	4,487	
New Construction	185,950	335,498	258,130	243,825	
Equipment & Furnishings	18,928	15,004	11,902	15,301	
Total Uses	216,040	362,774	275,466	267,135	-
NET CAPITAL CASH FLOW	95,435	(21,534)	13,338	(22,225)	-
INDEBTEDNESS ON PHYSICAL PLANT					
Beginning Balance on Principal	248,917	473,996	723,574	866,175	1,015,006
Additional Principal Borrowed	254,600	258,504	204,628	150,854	
Principal Payments Made During Year	2,825	8,926	5,793	2,023	
Extraordinary Balloon Pymts / Refinancings	26,696	-	56,234		
Ending Balance on Principal	473,996	723,574	866,175	1,015,006	1,015,006
Interest Payments Made During Year	13,089	13,684	22,902		
Accumulated Depreciation	388,768	402,668	446,341		

Maximum expected annual debt service obligation (principal & interest) on all outstanding debt
(exclude balloon payments expected to be refinanced from external funds)

Year: 2031 Amount: 275079

STUDENT ADMISSIONS DATA

(Fall Term)

Credit Seeking Students Only - Including Continuing Education

Massachusetts Institute of Technology	2 Years Prior 2001	1 Year Prior 2002	Most Recent Year 2003	Current Year 2004	Next Year Forward 2005
Freshmen - Undergraduate					
Completed Applications	10,671	10,490	10,664	10,549	10,466
Applications Accepted	1,726	1,787	1,724	1,735	1,665
Applicants Enrolled	1,012	1,030	978	1,019	1,077
% Accepted of Applied	16.2%	17.0%	16.2%	16.4%	15.9%
% Enrolled of Accepted	58.6%	57.6%	56.7%	58.7%	64.7%
Percent Change Year over Year					
Completed Applications	-	-1.7%	1.7%	-1.1%	-0.8%
Applications Accepted	-	3.5%	-3.5%	0.6%	-4.0%
Applicants Enrolled	-	1.8%	-5.0%	4.2%	5.7%
Aptitude Indicator: (Define Below)					
Mean Combined SAT I score (enrolled)	1466	1467	1469	1466	1469
Transfers - Undergraduate					
Completed Applications	290	320	379	319	302
Applications Accepted	43	40	25	5	6
Applications Enrolled	35	32	20	5	3
% Accepted of Applied	14.8%	12.5%	6.6%	1.6%	2.0%
% Enrolled of Accepted	81.4%	80.0%	80.0%	100.0%	50.0%
Master's Degree					
Completed Applications	6,609	6,349	6,959	6,235	5,324
Applications Accepted	2,094	1,972	1,719	1,721	1,632
Applications Enrolled	1,288	1,260	1,181	1,125	1,021
% Accepted of Applied	31.7%	31.1%	24.7%	27.6%	30.7%
% Enrolled of Accepted	61.5%	63.9%	68.7%	65.4%	62.6%
First Professional Degree - All Programs					
Completed Applications					
Applications Accepted					
Applications Enrolled					
% Accepted of Applied	-	-	-	-	-
% Enrolled of Accepted	-	-	-	-	-
Doctoral Degree					
Completed Applications	6,948	7,362	9,368	10,221	9,711
Applications Accepted	1,519	1,516	1,755	1,698	1,619
Applications Enrolled	704	705	886	821	824
% Accepted of Applied	21.9%	20.6%	18.7%	16.6%	16.7%
% Enrolled of Accepted	46.3%	46.5%	50.5%	48.4%	50.9%

STUDENT ENROLLMENT DATA

(Fall Term)

Credit Seeking Students Only - Including Continuing Education

Massachusetts Institute of Technology		2 Years Prior 2001	1 Year Prior 2002	Most Recent Year 2003	Current Year 2004	Next Year Forward 2005
UNDERGRADUATE						
First Year	Full-Time Headcount	1,017	1,033	988	1,022	1,083
	Part-Time Headcount					
	Total Headcount	1,017	1,033	988	1,022	1,083
	Total FTE	1,017.0	1,033.0	988.0	1,022.0	1,083.0
Second Year	Full-Time Headcount	1,091	1,036	1,057	978	1,018
	Part-Time Headcount	5	3	5	6	3
	Total Headcount	1,096	1,039	1,062	984	1,021
	Total FTE	1,093.0	1,037.0	1,059.0	980.0	1,019.0
Third Year	Full-Time Headcount	1,017	1,031	969	1,003	922
	Part-Time Headcount	9	6	5	3	2
	Total Headcount	1,026	1,037	974	1,006	924
	Total FTE	1,020.0	1,033.0	971.0	1,004.0	923.0
Fourth Year	Full-Time Headcount	1,070	1,053	1,099	1,066	1,054
	Part-Time Headcount	44	52	50	31	50
	Total Headcount	1,114	1,105	1,149	1,097	1,104
	Total FTE	1,085.0	1,070.0	1,116.0	1,076.0	1,071.0
Unclassified	Full-Time Headcount	4	4	2	1	1
	Part-Time Headcount	1	2	3	2	3
	Total Headcount	5	6	5	3	4
	Total FTE	4.0	5.0	3.0	2.0	2.0
Total Undergraduate Students						
	Full-Time Headcount	4,199	4,157	4,115	4,070	4,078
	Part-Time Headcount	59	63	63	42	58
	Total Headcount	4,258	4,220	4,178	4,112	4,136
	Total FTE	4,219.0	4,178.0	4,137.0	4,084.0	4,098.0
% Change FTE Undergraduate		-	-1.0%	-1.0%	-1.3%	0.3%
GRADUATE						
	Full-Time Headcount	5,575	5,632	5,789	5,928	5,907
	Part-Time Headcount	257	352	350	300	277
	Total Headcount	5,832	5,984	6,139	6,228	6,184
	Total FTE	5,661.0	5,749.0	5,906.0	6,028.0	5,999.0
% Change FTE Graduate		-	1.6%	2.7%	2.1%	-0.5%
GRAND TOTAL						
Grand Total Headcount		10,090	10,204	10,317	10,340	10,320
Grand Total FTE		9,880.0	9,927.0	10,043.0	10,112.0	10,097.0
% Change Grand Total FTE		-	0.5%	1.2%	0.7%	-0.1%
UNDERGRADUATE RETENTION RATES						
First Yr Stdts Returning for Second Yr		98%	97%	98%	98%	
6 Year Graduation Rate		91%	92%	91%	92%	

FACULTY PROFILE, PART 1

Massachusetts Institute of Technology		2 Years Prior 2001		1 Years Prior 2002		Most Recent Year 2003		Current Year 2004	
		FT	PT	FT	PT	FT	PT	FT	PT
Number of Faculty (Male/Female)									
Professor	Male	516	13	511	9	509	13	511	10
	Female	64	1	69	2	76	2	75	2
Associate	Male	139		139		135	1	143	
	Female	44		39		41		41	
Assistant	Male	129		143		148		139	1
	Female	41		44		41		51	1
Instructor	Male								
	Female								
Other	Male								
	Female								
Total	Male	784	13	793	9	792	14	793	11
	Female	149	1	152	2	158	2	167	3
Total Faculty									
Professor		580	14	580	11	585	15	586	12
Associate		183	-	178	-	176	1	184	-
Assistant		170	-	187	-	189	-	190	2
Instructor		-	-	-	-	-	-	-	-
Other		-	-	-	-	-	-	-	-
Total		933	14	945	11	950	16	960	14
Age (Minimum/Maximum/Mean)									
Professor	Minimum	33	37	33	38	35	39	35	51
	Maximum	77	75	78	72	78	79	80	74
	Mean	55	57	55	58	55	64	56	64
Associate	Minimum	30		32		29	39	30	
	Maximum	68		69		70	39	71	
	Mean	40		41		41	39	41	
Assistant	Minimum	26		20		21		22	34
	Maximum	58		59		60		61	35
	Mean	34		34		34		34	35
Instructor	Minimum								
	Maximum								
	Mean								
Other	Minimum								
	Maximum								
	Mean								
Years at this Institution (Minimum/Maximun/Median)									
Professor	Minimum							0	3
	Maximum							53	46
	Median							24	30
Associate	Minimum							0	
	Maximum							43	
	Median							9	
Assistant	Minimum							0	1
	Maximum							13	5
	Median							3	3
Instructor	Minimum								
	Maximum								
	Median								
Other	Minimum								
	Maximum								
	Median								

FACULTY PROFILE, PART 2

Massachusetts Institute of Technology		2 Years Prior 2001		1 Years Prior 2002		Most Recent Year 2003		Current Year 2004	
		FT	PT	FT	PT	FT	PT	FT	PT
Highest Degree Earned: Doctorate									
Professor				554	11	561	13	564	11
Associate				162		158	1	165	
Assistant				173		178		177	2
Instructor									
Other									
Total		-	-	889	11	897	14	906	13
Highest Degree Earned: Masters									
Professor				14		13	1	12	1
Associate				13		13		15	
Assistant				11		10		13	
Instructor									
Other									
Total		-	-	38	-	36	1	40	1
Highest Degree Earned: Bachelor's									
Professor				3		2	1	2	
Associate				1		1		1	
Assistant								1	
Instructor									
Other									
Total		-	-	4	-	3	1	4	-
Highest Degree Earned: Professional License									
Professor				8		8		8	
Associate				2		2		2	
Assistant									
Instructor									
Other									
Total		-	-	10	-	10	-	10	-
Teaching Load, fall term in credit hrs									
Professor	Minimum								
	Maximum								
	Median								
Associate	Minimum								
	Maximum								
	Median								
Assistant	Minimum								
	Maximum								
	Median								
Instructor	Minimum								
	Maximum								
	Median								
Other	Minimum								
	Maximum								
	Median								

FACULTY PROFILE, PART 3

Massachusetts Institute of Technology		2 Year Prior 2001	1 Year Prior 2002	Most Recent Year 2003	Current Year 2004
Base Salary for Academic Year					
Professor, Full Time	Minimum	68,500	69,400	70,000	71,400
	Maximum	206,455	214,920	225,666	213,341
	Mean	116,997	123,216	127,626	135,120
Professor, Part Time	Minimum				
	Maximum				
	Mean				
Associate, Full Time	Minimum	47,234	54,000	56,000	60,000
	Maximum	151,230	157,700	190,000	194,500
	Mean	78,744	82,890	86,999	91,504
Associate, Part Time	Minimum				
	Maximum				
	Mean				
Assistant, Full Time	Minimum	32,402	33,652	43,700	57,000
	Maximum	136,400	141,000	150,000	154,100
	Mean	72,111	74,803	79,172	82,608
Assistant, Part Time	Minimum				
	Maximum				
	Mean				
Instructor, Full Time	Minimum				
	Maximum				
	Mean				
Instructor, Part Time	Minimum				
	Maximum				
	Mean				
Other, Full Time	Minimum				
	Maximum				
	Mean				
Other, Part Time	Minimum				
	Maximum				
	Mean				
Fringe Benefits					
Professor, Full Time	Minimum	16,303	16,934	16,660	17,136
	Maximum	49,136	52,440	53,709	51,202
	Mean	27,840	30,046	30,428	32,450
Professor, Part Time	Minimum				
	Maximum				
	Mean				
Associate, Full Time	Minimum	12,328	14,580	15,232	16,560
	Maximum	39,471	42,579	51,680	53,682
	Mean	20,588	22,377	23,676	25,232
Associate, Part Time	Minimum				
	Maximum				
	Mean				
Assistant, Full Time	Minimum	8,522	9,322	12,061	16,074
	Maximum	35,873	39,057	41,400	43,456
	Mean	18,983	20,754	21,816	23,294
Assistant, Part Time	Minimum				
	Maximum				
	Mean				
Instructor, Full Time	Minimum				
	Maximum				
	Mean				
Instructor, Part Time	Minimum				
	Maximum				
	Mean				
Other, Full Time	Minimum				
	Maximum				
	Mean				
Other, Part Time	Minimum				
	Maximum				
	Mean				

FACULTY PROFILE, PART 4

Massachusetts Institute of Technology	2 Years Prior 2001		1 Years Prior 2002		Most Recent Year 2003		Current Year 2004	
	FT	PT	FT	PT	FT	PT	FT	PT
Number of Faculty Appointed								
Professor					3	1	1	
Associate					7		3	
Assistant					44	1	34	
Instructor								
Other								
Total	-	-	-	-	54	2	38	-
Number of Faculty in Tenured Positions								
Professor	580	14	580	11	585	15	587	11
Associate	91		100		101		105	
Assistant								
Instructor								
Other								
Total	671	14	680	11	686	15	692	11
Number of Faculty Departing								
Professor	12		3		4		3	
Associate	8		9		12		8	
Assistant	7		10		4		4	
Instructor								
Other								
Total	27	-	22	-	20	-	15	-
Number of Faculty Retiring								
Professor	4		13		11		6	2
Associate								
Assistant								
Instructor								
Other								
Total	4	-	13	-	11	-	6	2

FACULTY PROFILE, PART 5

Massachusetts Institute of Technology	2 Years Prior 2001		1 Years Prior 2002		Most Recent Year 2003		Current Year 2004	
	FT	PT	FT	PT	FT	PT	FT	PT
Number of Faculty by Department (or comparable academic unit)								
Architecture	27		29		29	1	29	1
Urban Studies and Planning	24		25		26		26	2
Program in Media Arts and Sciences	21		23		23		23	
School of Engineering Dean's Office	2		2		1		1	
Aeronautics and Astronautics	30		33	1	33	2	36	2
Chemical Engineering	32		32	1	31	1	32	
Civil and Environmental Engineering	39		39		40		36	
Electrical Engineering and Computer Sci	109	3	111	2	111	2	114	2
Mechanical Engineering	54		54		58		60	1
Materials Science and Engineering	34	1	33		36		33	
Ocean Engineering	15		14		15		14	
Nuclear Engineering	17		16		16		14	
Engineering Systems Division							1	
Biological Engineering Division	9		9	1	10		11	
Economics	30	2	30	2	30	1	31	1
Anthropology	6		7		6		7	
Foreign Languages and Literatures	8		8		11		9	
History	13		14		11	1	12	
Literature	14		15		15		15	
Music and Theater Arts	12		12		12		13	
Writing and Humanistic Studies	8	1	7		5	1	6	
Linguistics and Philosophy	21		21	1	19	2	19	1
Political Science	23		25		21		21	
Program in Science, Technology, and So	13		11		10		10	
Management	91	4	93	1	95	2	95	1
School of Science	1		1		1		1	
Biology	53		49		51		50	
Chemistry	29		28		29		31	
Earth, Atmospheric, and Planetary Scien	34		35		36		37	
Mathematics	52		52		52		53	
Brain and Cognitive Sciences	23		26		29		30	
Physics	69	2	68	1	66	2	68	
Health Sciences and Technology	4	1	5	1	5	1	5	1
Provost's Office	1		1		1		1	
Athletics, Phys Ed & Recreation	15		17		16		18	
Total	933	14	945	11	950	16	962	12

STUDENT HEADCOUNT BY UNDERGRADUATE MAJOR

Massachusetts Institute of Technology	2 Year Prior	1 Year Prior	Most Recent Year	Current Year
Fall Term	2001	2002	2003	2004
Certificate				
Total	-	-	-	-
Associate				
Undeclared				
Total	-	-	-	-
Baccalaureate				
Aeronautics and Astronautics	165	178	185	192
Anthropology				1
Architecture	59	60	61	52
Biology	262	257	282	279
Brain and Cognitive Sciences	92	110	107	114
Chemical Engineering	236	180	149	140
Chemistry	83	93	81	95
Civil and Environmental Engineering	69	62	77	78
Earth, Atmospheric, and Planetary Sciences	29	26	21	18
Economics	84	82	80	77
Electrical Engineering and Computer Science	1,091	1,065	996	865
Foreign Languages and Literatures	1			
History	6	2	5	1
Humanities	1		3	
Humanities and Engineering	7	5	6	7
Humanities and Science	1	2	1	2
Linguistics and Philosophy	10	8	6	10
Literature	4	5	4	6
Management	264	285	294	263
Materials Science and Engineering	99	101	85	104
Mathematics	182	183	210	186
Mechanical Engineering	292	264	276	293
Music and Theater Arts	2	4	5	7
Nuclear Engineering	18	18	26	35
Ocean Engineering	15	17	19	18
Physics	119	125	148	178
Political Science	16	17	23	23
Program in Comparative Media Studies				4
Program in Science, Technology, and Society			2	
Urban Studies and Planning	14	12	13	13
Writing & Humanistic Studies	3	5	5	10
Special Student	5	7	5	3
Undeclared	1,029	1,047	1,003	1,038
Total	4,258	4,220	4,178	4,112
Total Undergraduate	4,258	4,220	4,178	4,112

STUDENT HEADCOUNT BY GRADUATE PROGRAM

Massachusetts Institute of Technology	2 Year Prior	1 Year Prior	Most Recent Year	Current Year
Fall Term	2001	2002	2003	2004
Master's				
Aeronautics and Astronautics	155	158	164	166
Architecture	154	163	155	154
Biological Engineering Division	2	9	8	15
Biology	2	5		
Brain and Cognitive Sciences		1		
Chemical Engineering	64	53	69	58
Chemistry	2	3	2	1
Civil and Environmental Engineering	188	180	186	136
Earth, Atmospheric, and Planetary Sciences	14	11	11	11
Economics	1			
Electrical Engineering and Computer Science	403	403	406	394
Engineering Systems Division	104	113	119	119
Health Sciences and Technology	8	7	17	26
Linguistics and Philosophy				1
Management	786	811	826	847
Materials Science and Engineering	101	94	119	107
Mathematics			1	1
Mechanical Engineering	189	170	180	194
Nuclear Engineering	35	27	23	21
Ocean Engineering	81	73	81	87
Operations Research	11	9	12	9
Physics	9	10	5	4
Political Science	10	5	9	9
Program in Media Arts and Sciences	84	73	66	61
Program in Comparative Media Studies	13	20	20	17
System Design and Management	89	74	54	54
Urban Studies and Planning	133	139	154	150
Writing & Humanistic Studies			7	8
Total	2,638	2,611	2,694	2,650
Doctorate				
Aeronautics and Astronautics	66	72	67	79
Architecture	61	57	53	53
Biological Engineering Division	63	75	85	99
Biology	247	239	239	244
Brain and Cognitive Sciences	60	57	66	70
Chemical Engineering	142	154	159	178
Chemistry	226	238	244	259
Civil and Environmental Engineering	101	94	103	103
Earth, Atmospheric, and Planetary Sciences	126	121	130	136
Economics	132	131	133	130
Electrical Engineering and Computer Science	393	453	476	533
Engineering Systems Division	24	20	21	31
Health Sciences and Technology	105	117	128	136
Linguistics and Philosophy	69	69	68	64
Management	77	84	88	79
Materials Science and Engineering	78	86	97	95
Mathematics	109	118	124	115
Mechanical Engineering	180	181	179	192
Nuclear Engineering	82	80	84	90
Ocean Engineering	28	29	29	38
Operations Research	36	36	38	41
Physics	228	229	242	247
Political Science	82	71	76	67
Program in Media Arts and Sciences	57	78	66	62
Program in Science, Technology, and Society	24	25	28	27
Urban Studies and Planning	61	63	57	69
Total	2,857	2,977	3,080	3,237
First Professional				

STUDENT HEADCOUNT BY GRADUATE PROGRAM

Massachusetts Institute of Technology	2 Year Prior	1 Year Prior	Most Recent Year	Current Year
Fall Term	2001	2002	2003	2004
Total	-	-	-	-
Other				
Special Student - Graduate	158	210	180	155
Students working on Harvard degrees only	179	186	185	186
Total	337	396	365	341
Total Graduate	5,832	5,984	6,139	6,228

CREDIT HOURS GENERATED BY DEPARTMENT OR COMPARABLE ACADEMIC UNIT

Massachusetts Institute of Technology	2 Year Prior 2001	1 Year Prior 2002	Most Recent Year 2003	Current Year 2004
Undergraduate				
Civil and Environmental Engineering	6,026	6,419	7,254	6,613
Mechanical Engineering	9,673	9,042	8,991	9,951
Materials Science and Engineering	5,509	5,839	5,691	6,841
Architecture	3,747	3,580	3,307	2,915
Chemistry	10,923	10,681	11,170	11,423
Electrical Engineering and Computer Scier	38,647	40,023	35,888	32,691
Biology	13,153	12,918	13,827	15,767
Physics	14,023	14,640	14,578	14,794
Brain and Cognitive Sciences	4,359	4,917	4,718	5,276
Chemical Engineering	4,308	3,314	3,322	3,495
Urban Studies and Planning	1,445	1,720	1,749	2,004
Earth, Atmospheric, and Planetary Science	1,451	1,591	1,615	1,727
Ocean Engineering	525	750	1,178	1,277
Economics	7,132	6,426	7,288	6,677
Management	3,967	4,019	4,683	4,970
Aeronautics and Astronautics	4,612	5,203	5,137	5,249
Political Science	2,839	3,442	3,296	4,004
Mathematics	16,189	16,456	16,392	16,810
Humanities	96	74	46	50
Nuclear Engineering	356	855	576	782
Linguistics and Philosophy	2,334	2,529	2,610	2,600
Biological Engineering Division	545	626	886	839
Anthropology	1,083	1,395	1,104	839
Foreign Languages and Literatures	6,165	6,238	6,251	5,996
History	2,231	1,737	1,727	1,844
Literature	4,222	4,226	3,876	3,873
Music and Theater Arts	6,561	6,379	6,598	6,139
Writing and Humanistic Studies	3,597	3,699	3,079	2,926
Program in Comparative Media Studies	21	87	21	97
Engineering Systems Division	12	6		16
Health Sciences and Technology	440	262	471	476
Program in Media Arts and Sciences	885	979	1,413	818
Program in Science, Technology, and Soc	849	796	856	1,056
Total	177,925	180,868	179,598	180,835
Graduate				
Civil and Environmental Engineering	13,842	12,935	13,225	11,778
Mechanical Engineering	23,554	22,787	25,508	26,783
Materials Science and Engineering	10,952	11,444	13,382	12,766
Architecture	13,599	13,061	12,700	11,073
Chemistry	16,067	17,867	18,953	19,402
Electrical Engineering and Computer Scier	47,128	50,934	51,085	54,025
Biology	18,509	18,496	19,124	19,815
Physics	14,844	15,541	15,982	16,612
Brain and Cognitive Sciences	4,597	4,723	5,443	6,076
Chemical Engineering	11,217	12,329	12,972	13,516
Urban Studies and Planning	10,253	11,796	12,180	12,709
Earth, Atmospheric, and Planetary Science	8,863	8,470	9,177	8,783
Ocean Engineering	4,340	4,158	4,351	5,366
Economics	7,538	7,884	8,372	8,249
Management	53,193	52,918	54,230	52,191
Aeronautics and Astronautics	9,250	10,047	9,794	10,365
Political Science	5,019	4,910	5,196	4,969
Mathematics	8,242	9,004	9,727	9,655
Nuclear Engineering	3,484	3,405	3,578	3,129
Linguistics and Philosophy	2,928	3,023	3,030	2,580
Biological Engineering Division	4,473	5,552	6,441	7,939
Operations Research	1,088	1,060	1,322	1,189
Anthropology	57	51	54	66

CREDIT HOURS GENERATED BY DEPARTMENT OR COMPARABLE ACADEMIC UNIT

Massachusetts Institute of Technology	2 Year Prior 2001	1 Year Prior 2002	Most Recent Year 2003	Current Year 2004
Foreign Languages and Literatures	1,081	1,361	1,401	1,093
History	57	63	64	103
Literature	60	90	66	30
Music and Theater Arts	52	44	32	56
Writing and Humanistic Studies	91	129	262	238
Program in Comparative Media Studies	573	803	888	713
Engineering Systems Division	2,934	3,532	3,691	6,392
Health Sciences and Technology	12,096	13,297	15,032	14,852
Program in Media Arts and Sciences	12,588	12,879	11,412	11,283
System Design and Management	754	715	525	531
Program in Science, Technology, and Soc	1,172	1,242	1,389	1,402
Total	324,495	336,550	350,588	355,729

Optional Data, Explanations, Ratios Offerred by the Institution

Massachusetts Institute of Technology

Student Admissions Data

The Admissions Office uses a combination of factors to determine admittance. We have chosen to list the mean SAT I Verbal + mean SAT I Math scores for enrolling first year students for your request of only one Aptitude Indicator.

The Student Admissions Data Master's Degree section includes applications for applicants whose degree objective is a Master of Science, Master of Engineering, Master in City Planning, Master of Business Administration, Master of Architecture, or Engineer's Degree.

Faculty Profile, Part 2

Teaching Load, fall term in credit hrs

MIT does not track faculty teaching loads centrally in enough detail to provide an accurate responses to this question. Many of MIT subjects are taught by a team of faculty and staff. In addition, a large percentage of MIT's teaching activity is done outside of the traditional classroom setting. The percentage of total credit units taught in a traditional classroom/teaching laboratory method were:

2001	67%
2002	66%
2003	65%
2004	63%

The remaining credit units include individual instruction such as selected readings, graduate and undergraduate research, thesis, and graduate teaching preparation.

In the fall term of each year the following percentages of classroom/teaching laboratory credit units had the following ranks as the primary instructor.

2002	
Professor	55.9%
Associate Professor	11.4%
Assistant Professor	11.4%
All others	21.3%

2003	
Professor	54.1%
Associate Professor	10.2%
Assistant Professor	12.3%
All others	23.4%

2004	
Professor	58.0%
Associate Professor	9.1%
Assistant Professor	11.5%
All others	21.4%

CIHE DATA FORM SUMMARY

FINANCIAL HEALTH RATIOS

Massachusetts Institute of Technology		2 Years Prior 2001	1 Year Prior 2002	Most Recent Year 2003
Expendable Resources to Debt	Unrestricted + Temporarily Restricted Net Assets - (Land,Bldg,Equip Net + Funds Held Under Bond Agreement - Long Term Debt) / Long Term Debt	12.01	6.79	5.50
Expendable Resources to Operations	Unrestricted + Temporarily Restricted Net Assets - (Land,Bldg,Equip Net + Funds Held Under Bond Agreement - Long Term Debt) / Total Expenses	4.53	3.41	2.97
Total Net Asset to Operations	Total Net Assets / Total Expenses	5.67	4.61	4.11
Return on Net Assets	Change in Total Net Assets / Total Net Assets (Beginning of Year)	(0.04)	(0.10)	(0.02)
Net Income Ratio	Change in Total Unrestricted Net Assets / Total Rev & Net Assets Released from Restrictions	(0.06)	(0.16)	(0.08)
Net Operating Ratio	Change in Net Assets from Operations (*) / Total Rev & Net Assets Released from Restrictions	0.05	0.04	(0.02)
Total Resources per FTE Student				
(1)	Total Net Assets - Net Investment in Plant / FTE Students	765,348.89	679,342.80	652,710.64
(2)	Total Operating Expense / FTE Students	140,193.12	154,724.39	167,935.18
(3)	Total Operating Expense - Research / FTE Students	76,566.70	84,259.09	92,806.33
Debt Ratio	Change in Unrestr. Net Assets + Deprec. + Interest / Interest + Principal Payments	(0.82)	(7.54)	(3.24)
Debt / Equity	Total Net Assets / Long Term Debt	15.04	9.17	7.60
Capital Ratio	Depreciation + Interest / Total Operating Expenses	0.06	0.05	0.06
Age of Plant	Accumulated Depreciation / Depreciation	6.31	6.18	5.43

* Gains and Losses from Long-Term Investments, Extraordinary Gifts, and Contributions/Pledges Receivable over one year should be excluded from operating net assets ratios.

CIHE DATA FORM SUMMARY

FINANCIAL RATIOS

Massachusetts Institute of Technology		2 Years Prior 2001	1 Year Prior 2002	Most Recent Year 2003	Current Year Budget 2004
STATEMENT OF UNRESTRICTED REVENUES & EXPENSES RATIOS					
INCOME ALLOCATION					
Internal Sources					
Net Tuition & Fees	Net Tuition & Fee Revenue / Total Revenue & Net Assets Released - Aux. Ent. Exp - Indep Opr Exp	12%	10%	11%	10%
Endowment	Endowment Income Used in Operations / Total Revenue & Net Assets Released - Aux. Ent. Exp - Indep Opr Exp	18%	20%	18%	20%
Net Auxiliary & Other	Other Income + Sales & Svcs of Educ Activ + Auxiliary Ent Rev - Auxiliary Ent Exp / Total Revenue & Net Assets Released - Aux. Ent. Exp - Indep Opr Exp	7%	10%	#VALUE!	8%
External Sources:					
Net Independent Opr	Independent Operations: Rev - Exp / Total Revenue & Net Assets Released - Aux. Ent. Exp - Indep Opr Exp	0%	0%	0%	0%
Contributions	Contributions used in Operations / Total Revenue & Net Assets Released - Aux. Ent. Exp - Indep Opr Exp	7%	5%	5%	5%
Grants & Net Assets Released & Fed. Stdt Aid	Federal & State Student Aid + Govt & Private Sponsored Research + Net Assets Released from Restrictions / Total Revenue & Net Assets Released - Aux. Ent. Exp - Indep Opr Exp	56%	55%	58%	57%
RESOURCE ALLOCATION					
Education Core	Instruction + Research + Public Service + Academic Support / Total Rev & Net Assets Released - Aux. Ent. Exp - Indep Opr Exp	77%	79%	79%	78%
Student Life	Student Services / Total Rev & Net Assets Released - Aux. Ent. Exp - Indep Opr Exp	4%	4%	3%	3%
Institutional Support	Institutional Support + Other Expenses / Total Rev & Net Assets Released - Aux. Ent. Exp - Indep Opr Exp	14%	14%	19%	20%
Contribution to Net Assets from Operations	Change in Net Assets from Operations / Total Rev & Net Assets Released - Aux. Ent. Exp - Indep Opr Exp	6%	4%	-2%	-1%

CIHE DATA FORM SUMMARY 1

STATEMENT OF UNRESTRICTED REVENUES AND EXPENSES

PERCENT CHANGE YEAR OVER YEAR

Massachusetts Institute of Technology	1 Year Prior	Most Recent Year	Current Year Budget	Next Year Forward	2 Years Forward
	2002	2003	2004	2005	2006
	2001	2002	2003	2004	2005
OPERATING					
Revenue					
Tuition & Fees	2.4%	8.3%	2.8%	5.6%	-100.0%
Less: Financial Aid	11.0%	7.4%	6.9%	-0.9%	-100.0%
Net Tuition & Fees Revenue	-4.5%	9.1%	-0.9%	12.1%	-100.0%
Gov't Appropriations	-	-	-	-	-
Contributions used in Operations	-23.0%	-2.9%	16.5%	0.0%	-100.0%
Endowment Income used in Operations	17.4%	-1.8%	13.1%	-7.5%	-100.0%
Federal & State Student Aid	-	-	-	-	-
Gov't & Private Sponsored Research	6.9%	10.0%	2.6%	21.1%	-100.0%
Other Income	-	-	#VALUE!	11.0%	-100.0%
Auxiliary Enterprises	-0.9%	13.4%	8.4%	5.7%	-100.0%
Sales & Services of Educ Activities	44.4%	-19.3%	-55.5%	4.2%	-100.0%
Independent Operations	-	-	-	-	-
Total Revenues	8.0%	4.1%	5.2%	11.9%	-100.0%
Net Assets Released from Restrictions	95.8%	6.3%	39.5%	-100.0%	-
Total Revenues & Net Assets Release	8.7%	4.1%	5.7%	9.7%	-100.0%
Expenses					
Instruction	8.9%	5.3%	8.9%	3.3%	-100.0%
Research	11.3%	7.9%	0.2%	22.3%	-100.0%
Public Service	-8.4%	47.3%	9.0%	3.2%	-100.0%
Academic Services	16.7%	-8.6%	8.9%	3.3%	-100.0%
Student Services	10.7%	-9.1%	8.9%	3.3%	-100.0%
Institutional Support	8.6%	46.1%	8.9%	3.3%	-100.0%
Other Expense	-	-	-	-	-
Toal Education & General Expenses	11.0%	10.1%	4.8%	11.9%	-100.0%
Auxiliary Enterprises	9.6%	4.7%	5.4%	-0.6%	-100.0%
Independent Operations	-	-	-	-	-
Total Expenses	10.9%	9.8%	4.8%	11.2%	-100.0%
Increase (Decrease) in Net Assets from Operations	-28.9%	-150.3%	-48.0%	195.2%	-100.0%
NON OPERATING					
Gifts, Bequests, NonOperating Contributions	-	-			
Restricted Equipment Purchases	-	-			
Reinvested Gains & Losses & Income from Investments	89.2%	-83.5%			
Gains & Losses on Disposal of Property	-	-			
Other revenues and expenses, net	159.1%	-210.7%			
Increase (Decrease) in Net Assets from NonOperating Activity	83.1%	-67.6%			
Increase (Decrease) in Unrestricted Net Asset	181.7%	-49.2%			

CIHE DATA FORM SUMMARY 2

STATEMENT OF UNRESTRICTED REVENUES AND EXPENSES

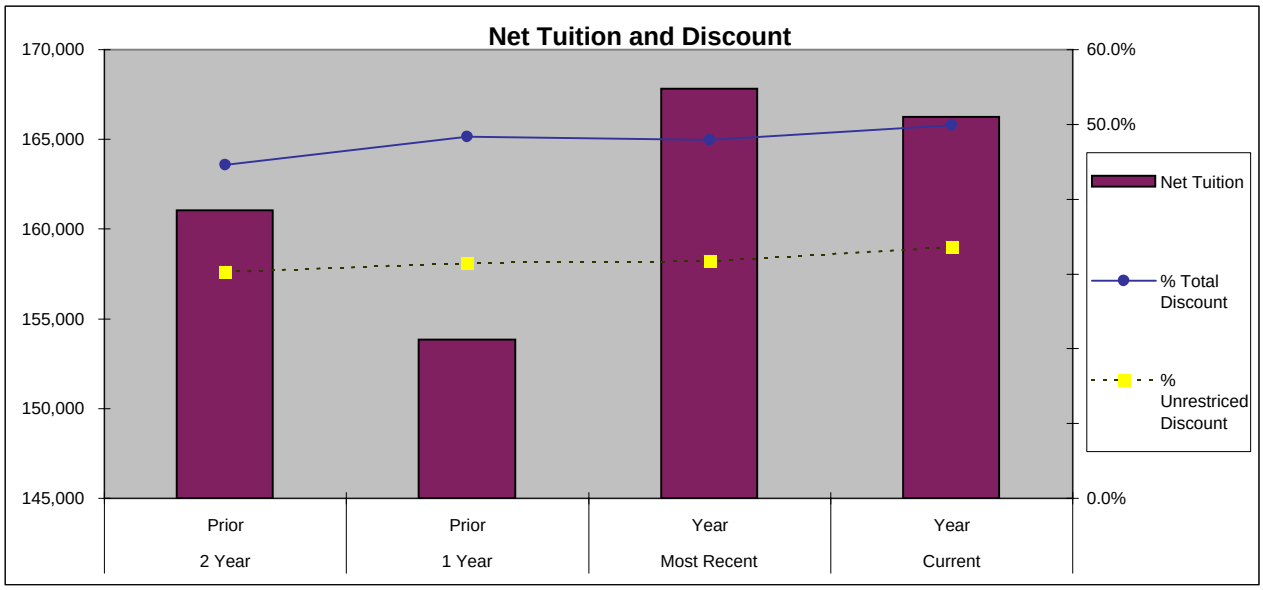
PERCENT OF TOTAL OPERATING BUDGET

Massachusetts Institute of Technology	2 Years Prior 2001	1 Year Prior 2002	Most Recent Year 2003	Current Year 2004	Next Year Forward 2005	2 Years Forward 2006
OPERATING						
Revenue						
Net Tuition Revenue	11.0%	9.7%	10.1%	9.5%	9.7%	-
Gov't Appropriations	0.0%	0.0%	0.0%	0.0%	0.0%	-
Contributions used in Operations	7.0%	4.9%	4.6%	5.1%	4.6%	-
Endowment Income used in Operations	17.2%	18.5%	17.5%	18.7%	15.8%	-
Federal & State Student Aid	0.0%	0.0%	0.0%	0.0%	0.0%	-
Gov't & Private Sponsored Research	51.8%	50.9%	53.8%	52.3%	57.7%	-
Other Income	0.0%	0.0%	#VALUE!	4.6%	4.7%	-
Auxiliary Enterprises	4.4%	4.0%	4.3%	4.4%	4.3%	-
Sales & Services of Educ. Activities	7.9%	10.5%	8.1%	3.4%	3.3%	-
Independent Operations	0.0%	0.0%	0.0%	0.0%	0.0%	-
Total Revenues	99.2%	98.5%	98.5%	98.0%	100.0%	-
Net Assets Released from Restrictions	0.8%	1.5%	1.5%	2.0%	0.0%	-
Total Revenues & Net Assets Release	100.0%	100.0%	100.0%	100.0%	100.0%	-
Expenses						
Instruction	19.6%	19.6%	19.8%	20.4%	19.2%	#DIV/0!
Research	42.9%	43.9%	45.5%	43.1%	48.1%	-
Public Service	0.0%	0.0%	0.0%	0.0%	0.0%	-
Academic Services	10.4%	11.2%	9.8%	10.1%	9.5%	-
Student Services	3.4%	3.5%	3.0%	3.1%	3.0%	-
Institutional Support	13.0%	13.0%	18.2%	18.8%	17.7%	-
Other Expense	0.0%	0.0%	0.0%	0.0%	0.0%	-
Toal Education & General Expenses	89.3%	91.2%	96.4%	95.6%	97.5%	-
Auxiliary Enterprises	5.2%	5.3%	5.3%	5.3%	4.8%	-
Independent Operations	0.0%	0.0%	0.0%	0.0%	0.0%	-
Total Expenses	94.5%	96.4%	101.7%	100.8%	102.3%	-
Increase (Decrease) in Net Assets from Operations	5.5%	3.6%	-1.7%	-0.8%	-2.3%	-

CIHE DATA FORM SUMMARY 3

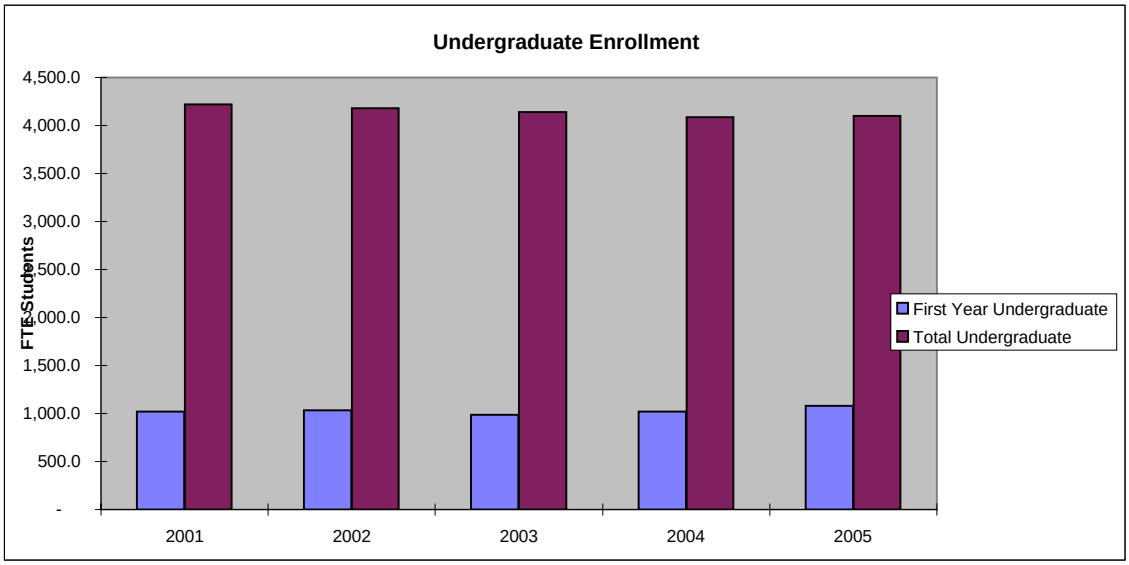
STATEMENT OF UNRESTRICTED OPERATING REVENUES AND EXPENSES

Massachusetts Institute of Technology	Most Recent Year 2003	Budget 2003	Variance Actual v Budge	Pct Variance
FROM OPERATIONS				
Revenue				
Tuition & Fees	322,525	0	322,525	-
Less: Financial Aid	154,692	0	154,692	-
Net Tuition & Fees Revenue	167,833	0	167,833	-
Gov't Appropriations	0	0	0	-
Contributions used in Operations (1)	76,380	0	76,380	-
Endowment Income used in Operations	289,822	0	289,822	-
Federal & State Student Aid	0	0	0	-
Gov't & Private Sponsored Research	892,405	0	892,405	-
Other Income		0	#VALUE!	-
Auxiliary Enterprises	71,797	0	71,797	-
Sales & Services of Educ. Activities	134,723	0	134,723	-
Independent Operations	0	0	0	-
Total Revenues	1,632,960	-	1,632,960	-
Net Assets Released from Restrictions	25,083	0	25,083	-
Total Revenues & Net Assets Release	1,658,043	-	1,658,043	-
Expenses				
Instruction	328,345	0	328,345	-
Research	754,519	0	754,519	-
Public Service	402	0	402	-
Academic Services	162,490	0	162,490	-
Student Services	50,453	0	50,453	-
Institutional Support	302,277	0	302,277	-
Other Expense	0	0	0	-
Toal Education & General Expenses	1,598,486	-	1,598,486	-
Auxiliary Enterprises	88,087	0	88,087	-
Independent Operations	0	0	0	-
Total Expenses	1,686,573	-	1,686,573	-
Increase (Decrease) in Net Assets from Operations	(28,530)	-	(28,530)	-
Footnote:				
(1) Includes receivables of:	0	0	0	-



Massachusetts Institute of Technology

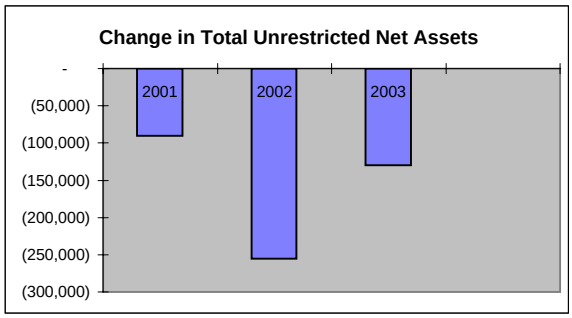
	2 Year Prior 2001	1 Year Prior 2002	Most Recent Year 2003	Current Year 2004
Tuition & Fees	290,835	297,924	322,525	331,670
Less:Financial Aid	129,804	144,085	154,692	165,400
Net Tuition	161,031	153,839	167,833	166,270
% Total Discount	44.6%	48.4%	48.0%	49.9%
Unrestricted Institutional Aid	88,075	93,729	102,405	111,700
% Unrestriced Discount	30.3%	31.5%	31.8%	33.7%

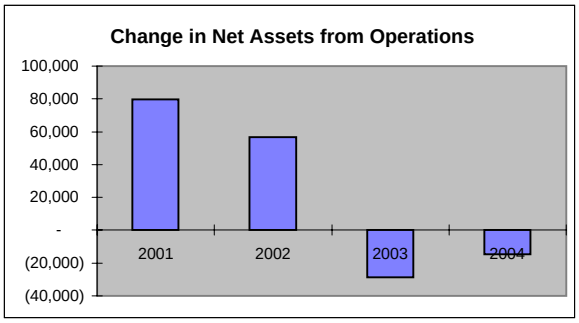


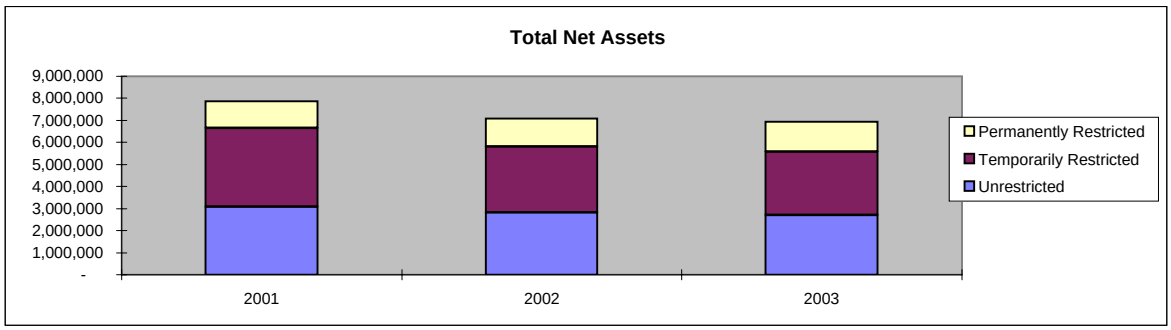
Massachusetts Institute of Technology

FTE Enrollment

	2001	2002	2003	2004	2005
First Year Undergraduate	1,017.0	1,033.0	988.0	1,022.0	1,083.0
Total Undergraduate	4,219.0	4,178.0	4,137.0	4,084.0	4,098.0







Massachusetts Institute of Technology

	2001	2002	2003	2004
Chg in Unrestricted Net Assets from Operatic	79,854	56,765	(28,530)	(14,830)
Chg in Total Unrestricted Net Assets	(90,627)	(255,334)	(129,738)	-

	2001	2002	2003
Unrestricted	3,082,161	2,826,827	2,697,089
Temporarily Restricted	3,555,186	2,976,337	2,881,496
Permanently Restricted	1,218,542	1,279,018	1,352,040
Total Net Assets	7,855,889	7,082,182	6,930,625