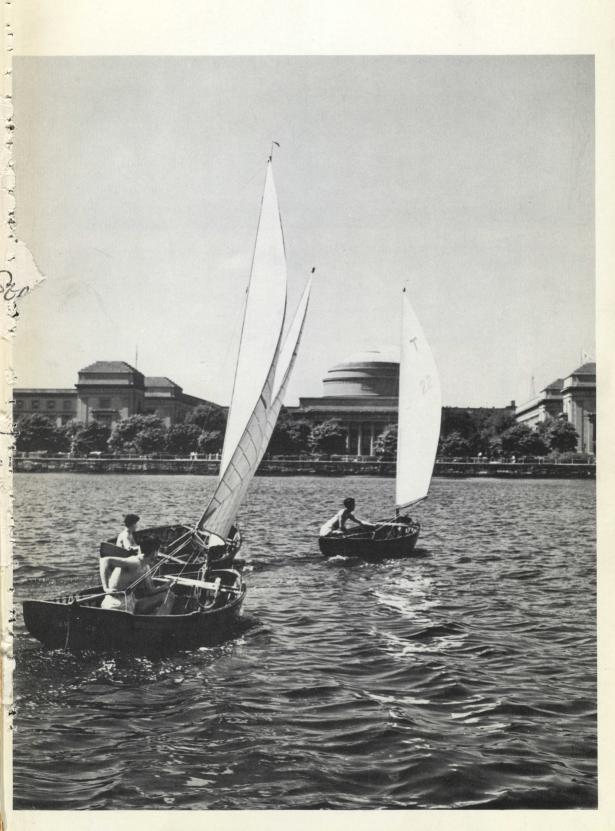


Volume 104 Number 1 September 1968

# This Is MIT







problems requires a basic comprehension of science and technology in balance with the appreciation for the valuable insight gained by the study of literature, history, and the arts. . . . We must seek a diverse society — one that utilizes the rich contributions of all fields of knowledge; and how can we do so without preparing our leadership groups broadly in both science and the arts?"

Howard W. Johnson
President
Massachusetts Institute of Technology



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High windows in the Student Center dining room look across Massachusetts Avenue to the columns and dome of M.I.T.'s main entrance.



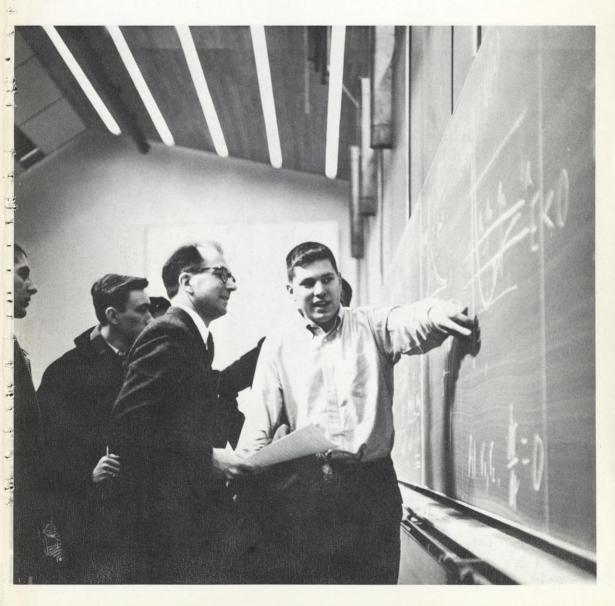
# This is MIT

The Massachusetts Institute of Technology is a modern university devoted to science, engineering, architecture, management and those social sciences and humanities that relate most directly to our developing technology. M.I.T.'s growing breadth is a response to the deepening influence of technology on every domain of human affairs, and in a very real sense the Institute is an expression of the inter-

dependence of present-day society.

M.I.T. provides an educational experience especially relevant to an era of advance and change. Here the undergraduate is immersed in a dynamic environment in which he can share in the interplay of a host of scholastic, cultural and research interests. M.I.T. is a residential community of scholars,

but not an isolated one. Sensitive to many human needs and concerns, it holds the strong conviction that scholars are most likely to be productive if they complement professional competence with active interest and participation in a variety of social endeavors.



# The Community

M.I.T. is a middle-sized university close to the center of a large metropolitan area. The Institute's campus, extending for more than a mile along the Cambridge side of the Charles River, looks across the water toward historic Beacon Hill and the central sections of Boston. M.I.T. thus combines the advantages of a self-contained residential campus with the wealth of educational, cultural, and social

opportunities available in a major urban center.

The M.I.T. community includes 7,400 students (3,800 of them undergraduates), 900 faculty members, a supporting teaching staff of about 600 — plus all the people who staff the research laboratories, administrative offices, and other facilities. Foreign students from 70 countries make up 13 per cent

of the student body. The Faculty also has an international aspect: each year about 150 of its members are from foreign countries. The Institute is coeducational; there are about 200 undergraduate women and a slightly larger number of coed graduate students.

Within a radius of three miles are a score of colleges and universities with a total enrollment



of nearly 75,000 full-time students. Among them, to name a few, are Harvard University, Radcliffe College, Boston University, Northeastern University, Simmons College, and several specialized art and music schools. Here is an extraordinary variety of people from all over the world and an impressive range of facilities and activities for students. From M.I.T. it is only a long walk or a

short bus trip to most of these campuses — and to the museums, theaters, concert halls and the downtown shopping, hotel and entertainment sections of Boston.

The Institute welcomes visits from prospective students. The Admissions Office is open from 9:00 a.m. to 5:00 p.m. on weekdays; it is closed on Saturday, Sunday, and holidays.

Advance appointments are not necessary. Student-led tours of the Institute leave the Admissions Office each weekday (except holidays) at 10:00 a.m. and 2:00 p.m.



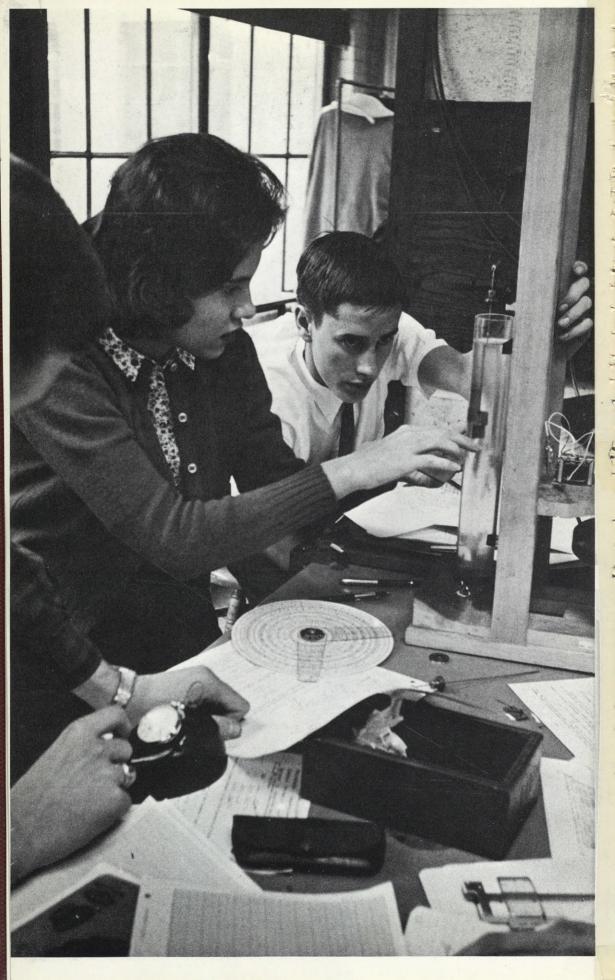
# The Undergraduate

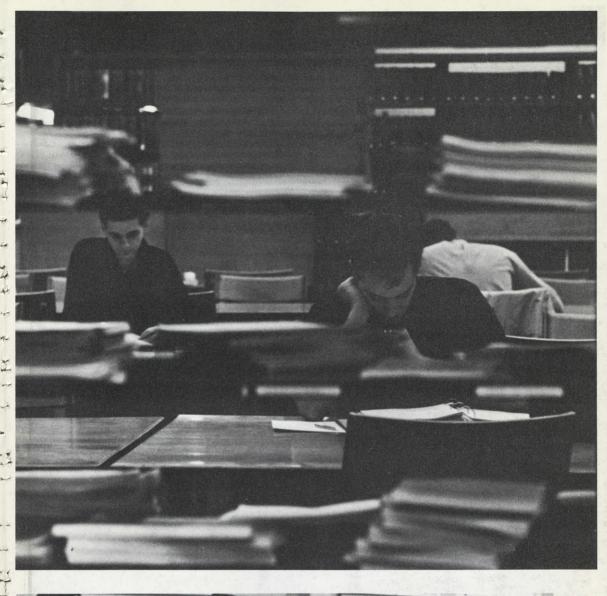
Walking from the Institute's main entrance past Kresge Auditorium, at right. M.I.T. students are a diverse group of individuals who have demonstrated the qualifications to do rigorous academic work.
M.I.T. is first of all an educational institution and its students must have the ability and desire to carry out the exciting and challenging courses of study.

They possess qualities such as leadership, creativity, and enthusiasm as evidenced by their participation in the cultural, social, and athletic activities both on campus and throughout the Boston area. Each of these young men and women contributes something of interest to the life of the M.I.T. community, and, looking ahead, it is hoped that each will become an alumnus who is a useful

and creative member of his professional and social communities. In this respect, M.I.T. is dedicated to education in the broadest sense, not merely to academic or professional training; such an education depends greatly on student relationships.



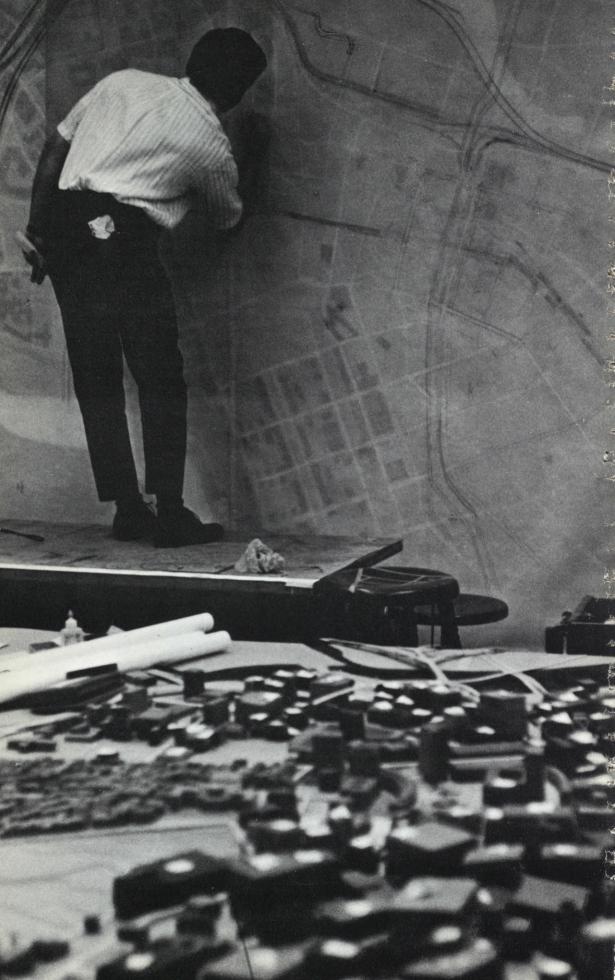






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# The Undergraduate Academic Programs

Students who enter M.I.T. share a basic desire to study further in science and mathematics, but every student who comes also should be prepared for serious study in the humanities and social sciences.

Emphasis on fundamentals and on self-reliance are central in M.I.T.'s educational philosophy: A strong sense of the quantitative and the analytical, a critical analysis of cause and effect, a demand for precision, and a powerful curiosity about things not understood enter every classroom.

M.I.T. is widely known for its contributions to new knowledge, achievements of a remarkable research enterprise that is shared broadly by faculty and students. This interlocking of research and teaching gives to M.I.T. an intellectual climate of extraordinary excitement, a spirit of ferment and creative innovation that every student inevitably shares. The continuing search for new methods of teaching, rapid assimilation of new knowledge into teaching programs, and constant emphasis on selfcriticism are evidence of the Faculty's commitment to maintain and extend the high quality of an M.I.T. education.

The curricula are largely unspecialized, flexible, and openended, giving students basic professional competence without focusing on technical detail. No student is required to select an area of major concentration until the end of his sophomore year, although most do so at the start of their sophomore year. This arrangement affords the opportunity for early concentration by a student who has settled on a particular department, and simultaneously gives other students time to explore

their interests and abilities before making a decision.

Most undergraduates study in at least three of M.I.T.'s schools, many in four, and a few in all five during the four years of their undergraduate work. Advanced undergraduates often register with graduate students for one or more of their classes; and many undergraduate and graduate students participate together in advanced research.

The intermixing of ages, disciplines, and nationalities, characteristic of the Institute, deeply influences the life and experience of every member of this academic community, bringing together students and teachers, managers and physicists, biologists and architects, humanists and engineers, young and old. The result is an academic environment unusual for its singleness of method and purpose and notable for its diversity of interest.

The scope of M.I.T. has always been wider than its title, "Institute of Technology," might suggest, and today the Institute's commitments to the humanities and social sciences are providing an entirely new dimension of scholarship. The increasing impact of science upon our social institutions and upon the conduct of industry and government has been reflected at M.I.T. in the emergence of active teaching and research in fields with which the physical and social sciences most directly interact fields such as economics, psychology, political science, linguistics, and the history and philosophy of science.

Each academic program leading to a Bachelor's degree has two divisions: the General

Institute Requirements and a Departmental Program. The General Institute Requirements consist, in part, of certain specific subjects in mathematics. science, humanities, and the social sciences; and also of elective science-oriented subjects, project-type laboratories, and upperclass humanities offerings. Collectively, these account for just about half of the total curriculum — 30 per per cent in mathematics and science and 20 per cent in humanities.

Each Departmental Program has specific subjects in the areas represented by that particular department and also additional opportunities for the student to take elective subjects of his choice both within and outside his major. Every student may use these elective opportunities to follow special interests, to deepen his preprofessional study, or to broaden his educational background in other fields. Within a department there are several major options, and a student may even develop his own interdisciplinary program with the assistance of his faculty advisor, subject to the approval of the department. Typically, 30 to 40 per cent of the total four-year curriculum will be in the major field, and the remaining 10 to 20 per cent will be unrestricted electives.

The undergraduate four-year majors in which the Institute offers instruction leading to the S.B. degree are:

# **School of Architecture**

Architecture
City Planning
History, Theory and Criticism
of Visual Arts
Visual Design

# School of Engineering

Aeronautics and Astronautics Chemical Engineering Civil Engineering Electrical Engineering Mechanical Engineering Metallurgy and Materials Science Naval Architecture and Marine Engineering

### School of Humanities and Social Science

Economics
History
Humanities and Engineering
Humanities and Science
Literature
Music
Philosophy
Political Science

### School of Management

Special Program in Management Behavioral Science in Management Management Science General Management

### **School of Science**

Chemistry
Earth Sciences
Life Sciences
Mathematics
Physics

There are also undergraduate subjects in seven fields in which only advanced degrees are offered (City Planning, Linguistics, Meteorology, Nuclear Engineering, Oceanography, Philosophy, and Psychology).

Law and medical schools attract a number of M.I.T.'s graduates each year. Specific medical school requirements can be met in almost any of the Institute degree programs by proper selection of elective subjects. Although law schools do not prescribe particular undergraduate preparation as a condition of admission, a showing of thorough learning in some area of study (such as economics, government, or mathematics) is viewed favorably. Faculty advisors have been appointed to assist students interested in both of these areas.

**The First-Year Program** 

For students entering M.I.T. with only the preparation implied by the entrance requirements, the first-year program commonly contains electives and required subjects in mathematics, physics, chemistry, and humanities. These subjects provide an appropriate preparation for all the courses of undergraduate study offered at M.I.T.

One possible schedule for the two terms of the first year is as follows:

			45	
1.00	Information Systems	3	3	6
21.018	Conflict and Community in America	3	0	6
18.02	Calculus	4	0	8
8.02	Second Term Physics II	5	0	7
		51		
Seminar	America Vietnam: A Democratic Dilemma	3 2	0	6 4
21.017	Conflict and Community in	•		•
18.01	Calculus	4	0	8
8.01	Physics I	5	0	7
5.01	Chemistry	5	0	7
	First Term	Units**		

The faculty considers that 45 to 51 units per term is a typical student load. A heavier or lighter program can be carried by a student with the approval of his faculty counselor.

There are many other possible first-year programs. Entering students with degree credit in one or more of the first-year subjects may substitute more advanced subjects in the same areas or may use the time thus made available for electives or science distribution subjects. If the credit is in the appropriate prerequisites, the student may begin elementary work in a professional field by taking subjects which would usually occur in his second or third year. The procedures by which degree credit at entrance is earned are described in the Institute's General Catalogue.

Some students may find it appropriate to their specific backgrounds to postpone one of the major scientific subjects (such as Physics I [8.01] or Chemistry [5.01]) until the second term of the year. They can use the time thus made available to pursue independent study or to supplement their high school preparation.

<sup>&</sup>quot;Units are shown on a "time-distribution" system, showing in sequence units allotted to recitation and lecture; laboratory, design, or field work; and preparation. Each unit represents one hour of work per week or 15 hours of work per term. The total unit credit for a subject is obtained by adding together all the units shown.

There are basically five alternative forms of humanities that may be taken during the	Both the Freshman Elective Subjects and the Undergraduate Seminars provide opportunities to explore fields of potential interest. Faculty counselors stand ready to assist students with respect to their selection. The following subjects are a partial list of those available.				9.00	Introductory Psychology	3	0	5 ~	
first year at M.I.T. These are:					12.201	Earth Science	2	1	3	
The Western Tradition: The Classical Heritage <sup>1</sup> The European Heritage <sup>1</sup>					12.202	Elementary Astronomy	2	0	4 3	
Identity and Autobiography: The Nineteenth Century The Twentieth Century					15.00	Introduction to Managerial Accounting	3	0	3	
	1.40	Introduction to				16.70	Aircraft and Spacecraft			
Language, Culture, and Community: Primitive Culture and Ancient		Microscopy	1	3	2		Design	2	4	0
Civilization Elizabethan England and Modern	1.401	Physics of Materials	3	0	3	16.81	Flight Vehicles	3	0	3
America  Conflict and Community in America	2.711	Engineering				17.01	Society and Man	3	0	6
God and Logic: The Philosophy of		Geometry	0	4	2	18.00	Elementary Number Theory	2	0	4 -
Religion in the West	2.723	Elementary Nomography	2	0	4	19.003	Elementary Meteorology I	0	0	4
The first-year electives may be chosen from subjects expressly designed for this purpose (the regular Freshman Electives and the Undergraduate Seminars), from foreign language subjects for which the student is qualified, from upperclass electives in humanities without prerequisites, or from any other subjects offered by the Institute for which the student either has the prerequisites	3.09	Structure and Properties of				21.094	Introduction to	2	U	4
		Materials	3	0	3	21.001	Contemporary Philosophy	2	0	4
	4.011	Graphics Laboratory I	0	3	2	21.096	Prose		•	
	6.47	Introduction to				AS 11	Composition World Military	2	0	4
		Computation	2	2	2	ASTI	Systems	3	1	3
	7.00	Perspectives in Life Science	2	0	4	MS 11	Military Science - Its Historical Perspective	2	1	1
or has sufficient preparation to justify the waiving of the prerequisites by the instructor	8.001	Introduction to Physical Ideas	2	0	4	NS 11	Orientation and Sea Power	3	1	5
in charge.										

<sup>&</sup>lt;sup>1</sup>These subjects are offered in French for students having an adequate background in French.

The Undergraduate Seminars differ from the regular Freshman Electives in that they are designed to allow students to work in small groups in close association with faculty members. Less formally organized than customary classroom or Laboratory subjects, they offer an opportunity for study with a high degree of individual responsibility and freedom in planning and executing a selected program. The seminars cover a wide range of topics and involve many different types of study. A list of those available is supplied to firstyear students during the summer.

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Among the 40 seminars offered last year were:

The Birth and Care of a City Professor Douglas P. Adams

Human Decision Making in Vehicle Guidance Professor William R. Ferrell

Understanding our Photographic Environment Professor Minor White

Fundamentals of Photochemistry Professor Lawrence J. Heidt

Stroboscopic Light Professor Harold E. Edgerton

Cell Ultrastructure Professor Robert N. Dowben

Air Pollution Professors William H. Dalzell and Jack B. Howard

Astronaut and Aquanaut Life Support Systems Professor Robert C. Reid

Sailing Yacht Research Professor Halsey C. Herreshoff

Philosophy East and West Professor Huston Smith

# **Other First-Year Electives**

The Department of Modern Languages and Linguistics offers French, German, Russian, and Spanish. Students who wish to begin or continue the study of a language begun in school are welcome to consult with the instructors in the Department.

Crews practicing on the Charles pass the M.I.T. boathouse and, behind it, one of the Institute's dormitories for men. At left is Westgate, an apartment tower for married students.

# The Undergraduate Life

More than three-quarters of

M.I.T. undergraduates live in

student residences on the cam-

the remainder live at home or in

apartments near the campus. All

women undergraduates, except

married students or those living at home, live on the campus in McCormick Hall.

About 1,600 students live in the six Institute Houses on campus,

pus and in nearby fraternities;

each with its own student government and dining facilities. All Houses are open to members of all classes and welcome freshmen as full members of the community. There are no "freshman" dormitories. The fraternities at M.I.T. are distinguished by their acceptance of responsibility in setting their own standards and in managing their own affairs. More than one-third of the male undergraduates belong to one of the 28 chapters (27 national and one local), each with its own house in Cambridge or Boston.

Residence



# **Activities**

M.I.T. offers more than a challenging curriculum, for the Institute does not expect its students' learning experience to take place only in the classroom and laboratory or in the preparation of homework each night. Each student may find a wealth of informal educational experience in student government, hobby and professional clubs, music, drama, and athletics. Student publications in-

clude a newspaper published twice a week, an engineering journal, a humor magazine, and two literary magazines. An FM-AM radio station broadcasts daily almost around the clock. There is a vigorous dramashop and a variety of musical activities. Altogether there are over 90 different clubs and organized activity groups. The following partial list indicates the variety of interests.

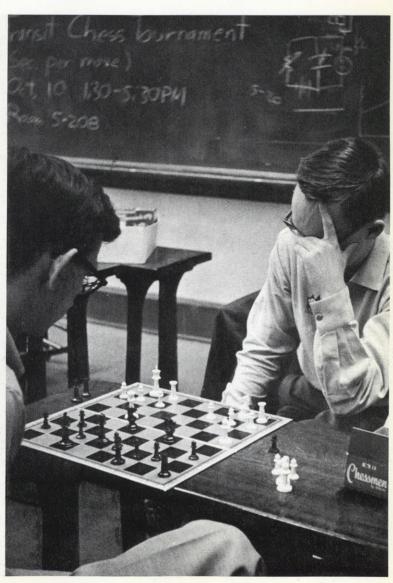
Alpha Phi Omega (service fraternity)
American Institute of Physics
American Society of Mechanical
Engineers
Beaver Key (junior class honorary)
Bridge Club
Chess Club
Civil Rights Committee
Club Latino
Concert Band
Concert Jazz Band

Debate Society
DeMolay
Dramashop
Eulenspiegel Verein
Film Society
Flying Club
Gilbert and Sullivan Society
Glee Club
Hillel
Hobby Shop
Innisfree (journal of debate)
Institute of Electrical and
Electronics Engineers

Lecture Series Committee
Mathematics Club
Open House Committee
Outing Club
Parapsychological Research
Group
Radio Society (W1MX)
Rocket Research Society
Scabbard and Blade (military honorary)
Science Fiction Society
Socialist Club
Social Service Committee

Society for Social Responsibility of Science
Sports Car Club
Strategic Games Society
Student Art Association
Student Metallurgical Society
Symphony Orchestra
Tangent (literary journal)
Tau Beta Pi (engineering honorary)
The Tech (newspaper)
Tech Catholic Club
Tech Engineering News





Tech Model Aircrafters
Tech Model Railroad Club
Technique (yearbook)
Technology Student Enterprises
Tech Show
United Christian Fellowship
Voo Doo (humor magazine)
WTBS Radio
Young Americans for Freedom
Young Democratic Club

Young Republican Club

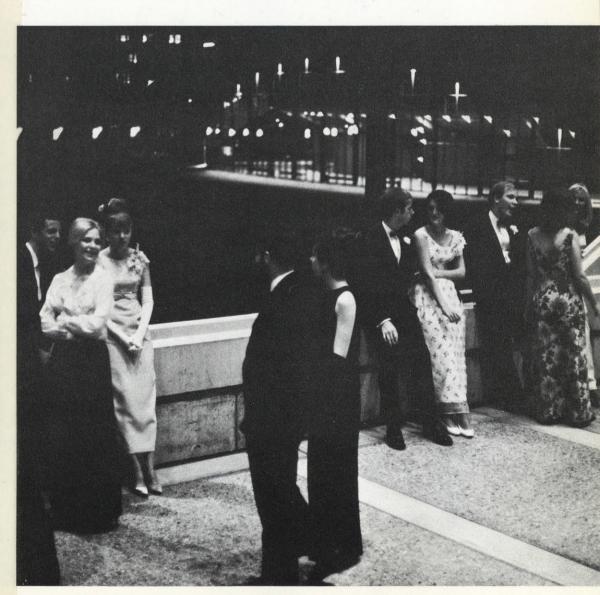
The management of these activities is the principal responsibility of the student government, an elaborate organization of student committees reporting to the Institute Committee, the Chairman of which is the President of the Student Body. Through councils and committees, the student government runs its own affairs, administers an annual student activities budget of more than \$70,000,

handles disciplinary cases involving students and student activities, certifies various student groups for activity on the campus, provides its own publicity services, represents students in discussions of educational policy with the Faculty, and programs events and supervises management of the Student Center.



M.I.T.'s Student Center is the focus for student government and for many other community activities. It provides student activity offices, meeting rooms, restaurants, stores, a bank and post office, pool tables and bowling lanes, art and photography areas, a large reading room, music rooms, and a general-purpose room that can be converted from lounge to ballroom. The Student Center and

the adjacent Kresge Auditorium and Chapel form a community center that is widely praised for its beauty and effectiveness. Nearby are quarters for religious counselors; M.I.T. has no official religious position, but encourages any recognized religion to organize an oncampus group and to assign a religious counselor for full-time or part-time work on campus.



# **Athletics**

M.I.T. has varsity and freshman intercollegiate teams in baseball, basketball, crew, crosscountry, fencing, golf, gymnastics, hockey, lacrosse, pistol, rifle, sailing, skiing, soccer, squash, swimming, track and field, tennis, and wrestling. Competition includes many New England and Ivy League colleges.

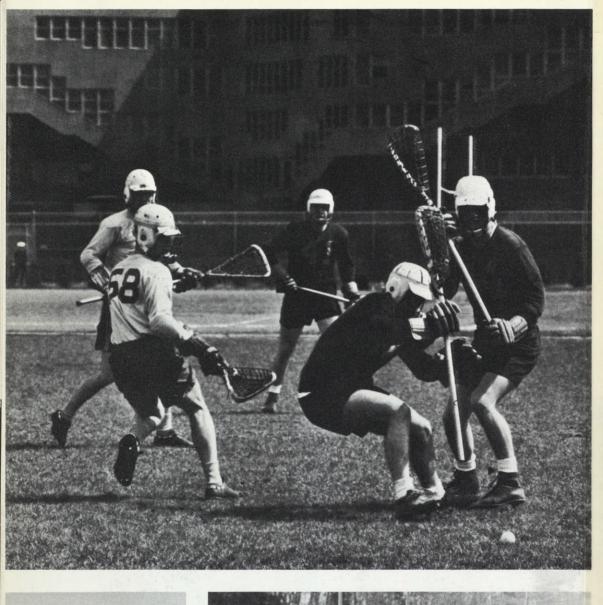
One objective of the athletic program is an introduction to

sport skills and recreation through physical education. This program is a natural springboard into the intramurals, which provide competitive outlets in 19 sports. As students' interests are defined and their skills developed, they come to participate in the intercollegiate program, which includes varsity and freshman teams in 20 sports and more than 450 intercollegiate contests a year.

Last year M.I.T. undergraduates participated in more than 1,500 intramural contests. There were league competitions in badminton, basketball, bowling, cross-country, cycling, golf, hockey, rifle, sailing, squash, swimming, softball, table tennis, touch football, track, volleyball, water polo and wrestling. Club sports provide intercollegiate competition, but less formal organization than varsity teams.













# Application Procedure and Financial Aid

### **Application for Admission**

Freshmen may enter the Institute only in September. Final application, including all supporting materials, is due in the Admissions Office by January 15 of the calendar year of entrance.

## **Subject Requirements**

Most secondary schools, public and private, offer the necessary subjects for admission to M.I.T. If a student takes his work seriously and makes the most of what is available, even a small school can provide very adequate preparation. M.I.T. is careful to judge a candidate on his own merits, not on the merits of his school. The freshman class generally represents more than 700 schools, of which about 80 per cent are public.

Specifically required for entrance are four years of English, mathematics through trigonometry, physics, and chemistry. The mathematics should include the standard topics in elementary and intermediate algebra, plane geometry, and trigonometry, but the precise form of the mathematics curriculum is not important so long as it will prepare a student to go on directly to calculus. A good score on one of the mathematics achievement tests of the College Entrance Examination Board is generally an indication of satisfactory preparation. If a student has covered the standard topics before his senior year, he probably should continue by taking either calculus or other more advanced topics in mathematics that may be offered by his school. The physics and chemistry may be covered in one-year subjects or in an integrated sequence in physical science. Either way it is important that the equivalent of a full school year be devoted to each subject.

### **Entrance Examinations**

M.I.T. requires every applicant to take the College Board (CEEB) tests, including the Scholastic Aptitude Test and the Achievement Tests in

- 1 Level I or Level II Mathematics,
- 2 Physics or Chemistry, and 3 English Composition or American History and Social Studies or European History and World Cultures. The Writing Sample may *not* be substituted for the English Composition test.

The tests may be taken at any time, and any number of times, but should be completed not later than January of the senior year. The tests will be offered at centers throughout the world on the following Saturdays during the coming year:

July 13, 1968 November 2, 1968 December 7, 1968 January 11, 1969 March 1, 1969 May 3, 1969

You should take each test at the time best for you, when you will be most likely to do yourself justice. Thus, if you complete physics or chemistry in your junior year at school, you are strongly advised to take the achievement test in that subject in May or July of that year when the subject is fresh in your mind. If you miss taking the test in your junior-year science subject, it is probably to your advantage to take this test in December or January rather than the test in your senior-year subject. However, when a test in the seniorvear science is taken in December or January, M.I.T. makes allowance in interpreting the score. If you take any test more than once, M.I.T. uses the higher score.

If you have studied the standard topics of elementary and intermediate algebra, plane geometry, and trigonometry in mathematics, you should probably take the Level I Mathematics examination. If you have had the opportunity to take accelerated. enriched, or "modern" programs in mathematics and have covered such topics as functions, sequences, limits, number theory, logic and proof, probability and approximation, you should take the Level II examination in mathematics. M.I.T. suggests that you talk with your mathematics teacher about the appropriate one for you to take; the admission decision will not be prejudiced by the test taken.

You should plan your tests in consultation with your guidance counselor or director of studies and should apply to take the tests by writing directly to the

College Entrance Examination Board Box 592 Princeton, New Jersey 08540

or to the

College Entrance Examination Board Box 1025 Berkeley, California 94701

### Conference

A personal conference is an essential part of the final appli- cation process. Candidates who live close to Cambridge are asked to come to the Admissions Office for this conference. Other candidates are referred to representatives of the Institute in their area. These representatives are members of the M.I.T. Educational Council, a group of alumni who are chosen for their interest in counseling students about education in a science-centered university and about the broad career fields opened to them by such an education. These alumni are familiar with current developments at the Institute and with the basic procedures of admission and financial aid. They work closely with many high school guidance staffs. In addition to the customary conference, M.I.T. educational counselors welcome the opportunity to chat informally with prospective students about college and career planning.

The appropriate time for this required conference is between May 1 of the junior and January 15 of the senior year. However, a student with questions he would like to discuss is encouraged to have a conference at any time. If a student has had a conference before May 1, he is asked to arrange another nearer the time for filing the final application.

### **Expenses and Financial Aid**

M.I.T. assures every admitted student assistance equal to his financial need. (Financial need is defined as the difference between the cost of an M.I.T. education — as outlined below — and a student's own resources: his parents' contribution, his summer earnings, and a portion of his assets.)

M.I.T. recognizes that the investment in education is substantial. As a matter of principle, the Institute expects students and their families to pay as much as they can. M.I.T. participates. with 900 other colleges and universities, in a program for equitably defining the amount a student's family should be able to provide. This program was established by the College Scholarship Service and centers on a careful evaluation of family finances as presented on the Parents' Confidential Statement form, M.I.T. assures each applicant of help to offset costs in excess of the resources determined in this manner.

Expenses are roughly estimated to be: Tuition, \$2,150; Room and Board, \$1,170; Books and Materials, \$150; and the Student Health Program, \$90. In addition to these basic expenses, an allowance must be made for clothes, meals during vacation, social activities, and the extra outlay a student incurs in going away from home; a reasonable estimate of such other expenses is about \$400. The cost of travel must also be considered in an over-all budget.

All candidates for admission will receive an application for financial aid and a comprehensive brochure describing fully the Institute's aid program (including a thorough section regarding "need analysis"). Every student who wishes to be considered for financial aid should return the application to the Student Aid Center by January 15 of the senior year. The Parents' Confidential Statement, available from secondary schools or the College Scholarship Service, must also be filed by that date. Announcements of decisions about financial assistance are sent in mid-April to admitted students who have applied for aid.

A source of support open to all United States students, regardless of financial need, is the Institute's Installment Credit Plan. The Deferred Payment Plan may also be used by every student to pay all formal charges in eight installments spread over the academic year.

Applications for financial aid are considered separately from admission applications and have no bearing whatsoever on the admission decision. Every student is encouraged to review carefully all of the means of meeting costs and no one should be deterred from applying for admission to M.I.T. because of anticipated financial difficulty.

Photographs: Ivan Massar-Black Star, inside cover (below), pp. 1, 2, 9, 20, 21; Leonard McCombe (Time-Life Books. © Time Inc.), pp. 6 and 7.





