



MASSACHUSETTS
INSTITUTE OF
TECHNOLOGY

TASK FORCE
ON THE

UNDERGRADUATE EDUCATIONAL COMMONS
STUDENT ADVISORY COMMITTEE



PRELIMINARY REPORT

ADVISING, THE HUMANITIES, ARTS, AND SOCIAL
SCIENCES REQUIREMENT,
THE COMMUNICATION REQUIREMENT, AND THE
SCIENCE GENERAL INSTITUTE REQUIREMENTS



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I. INTRODUCTION

The Student Advisory Committee (SAC) to the Task Force on the Undergraduate Educational Commons was formed to collect student opinion about the MIT undergraduate experience and to develop recommendations for improvement. Approximately ten self-selected student volunteers, representing a cross-section of the MIT undergraduate population, comprise the SAC. Although the entire student body was not surveyed prior to the writing of this report, the SAC will gather student feedback on this draft and produce a second version that cites the undergraduate reaction.

This report delves into major issues affecting undergraduates: advising, the HASS requirement, the CI requirement, and the science GIRs. The SAC is also discussing other issues, such as diversity, the physical education requirement, and double degrees versus double majors, and may report on these in the future.

Formulating the solutions in this proposal was a challenge. Members of the SAC often had conflicting opinions and compromised to reach the most satisfactory solutions overall. The committee appreciates serious consideration of its opinions and suggestions.

II. ADVISING

Advising is essential for students throughout their education. All faculty should serve as informal advisors, willing to help students with questions or concerns, but the formal advising system is especially important. An official advisor must:

- **Provide personal connection and support.** A better understanding of one's advisees leads to better advising.
- **Have a solid knowledge of the requirements,** whether these are the GIRs for freshmen or the GIRs and departmental requirements for upperclassmen.
- **Make resources known.** The freshman advisor should serve as a switchboard, directing students to various sources of help, while departmental advisors should be prepared to handle the major-related concerns of advisees.
- **Provide a broader context for a student's education.** Students do not always realize how their studies at MIT fit into the "big picture" or what they can accomplish once they leave the Institute.
- **Stimulate interest in education.** Freshmen often lack direction and upperclassmen benefit from enthusiasm for their major.

To ensure these goals are met entirely and efficiently, the SAC has several recommendations. For freshman advising:

- Collect anonymous advising evaluation forms, similar to course evaluations, after the fifth week, which can help faculty better develop their advising methods. Hold advisors accountable for their performance. Evaluations should be taken seriously, and for poor advisors to advise again, they should demonstrate improvement by taking seminars through their departments or by other appropriate methods. This level of training should also be available to new advisors. This feedback and accountability should ensure that advisors are satisfying the basic needs of their advisees.
- Publish a "What to do if you're having a bad advising experience" packet with an "advising web" illustrating to whom the students can turn for additional help (such as GRTs, academic administrators, housemasters, coaches, chaplains, etc.). This web should also emphasize upperclassmen and alumni as resources.
- Create and publish a list of "open advisors", a set of faculty and others from the above advising web chosen for their ability to fulfill the advising goals. They should serve as go-to points for freshmen with questions or issues. If a freshman feels uncomfortable speaking candidly with his/her assigned advisor, he/she can go to an open advisor, who will provide feedback to the original advisor without revealing the student's identity. These open advisors will not only provide personal support for students in need but they will also be the sources for detailed information about their respective departments.
- Publish a set of modules that advisors must hand out and review with their students. These modules would contain information on important classes and resources for freshmen as well as other advising resources. Thus even if an advisor cannot clearly articulate the differences between certain classes or answer a specific question, the modules should clearly explain any pertinent issues and provide further references.
- Encourage students to be proactive in interacting with their advisor, and encourage advisors to take a personal interest in their students. Having a personal connection with an advisor significantly improves a student's advising experience. This personal connection seems difficult to mandate; one suggestion is to require advisors to meet individually with each of their students at least twice a semester, and another is to publish a listing of advising hours, similar to office hours, when students can consult their advisor.

- Have at least one associate advisor (upperclassman) per advisor. Some advisors have several and others have none. Students ubiquitously praise the advice provided by associate advisors, as these upperclassmen can draw from their own experiences to give frank and accurate suggestions and help about the freshman year and beyond.
- Give teaching credit for advising in every department. Currently, different departments give different incentives to the faculty to be freshman advisors. Compensating advisors in some standard way would improve advising by encouraging accountability and a feeling of ownership and may also motivate more faculty members to advise freshmen. Additionally, some form of Institute-wide commendation for strong advising could also lead to improvement.

For upperclassman (departmental) advising:

- Each advisor should maintain a checklist of requirements for the major to track each advisee's progress toward the degree. Advisors should discuss these plans with their students every semester. This practice is not currently standard across all departments.
- Encourage experienced juniors and seniors to act as departmental associate advisors for students new to the department. Like associate advisors in the freshman advising program, these students would provide an insider's view of student life in the department, give sound advice, and point students to other resources.
- Encourage graduate students and/or recent alumni to hold forums about post-graduation options for students in the department as well as their personal career paths. As the job and educational market changes, this advice is likely to be more relevant than that of the faculty.
- As with freshman advising, MIT should evaluate advisor performance and offer training for those who could benefit.

(For further reference, one may consult the Baker Foundation's Guidelines for Upperclass Advising, written in 1996 but adhering to principles similar to those we have outlined here.)

III. THE HASS REQUIREMENT

Humanities, Arts, and Social Science (HASS) courses are an essential part of an MIT education. These courses should:

- Expose students to problems that do not have specific solutions.
- Foster broad and critical views of the world, contextualizing technical study.
- Create lasting awareness, curiosity, and understanding in diverse subjects.
- Develop critical reading and thinking skills.

- Practice and teach written and oral communication.

HASS courses should be a significant part of a student's academic program and offer both breadth and depth. The current minimum of eight HASS courses represents the importance of HASS to an MIT education; lessening this requirement would betray the importance students and graduates place on the HASS experience.

A distribution requirement is necessary to expose students to the breadth of HASS offerings and engage them in new topics and modes of thinking. The current HASS-D system, however, fails for reasons discussed below. A concentration requirement ensures students study non-technical material at an advanced level. The current requirement of three to four courses in an advised HASS concentration is appropriate and effective and should remain.

The current implementation of the overall HASS requirement has severe shortfalls. Students are not fully engaged and often do not take HASS courses as seriously as more technical coursework; the complex and confining structure of the HASS-D requirement exacerbates this disengagement. The relative paucity of HASS-D offerings meeting scheduling and distribution constraints frustrates students, as does the HASS-D lottery. This perceived lack of choice – made worse by the additional need to fulfill the CI-H requirement, oversized classes that inhibit active participation, and a lack of advanced HASS-D offerings for upperclassmen – further fuels student apathy.

The SAC proposes two concomitant solutions: increased rigor for the HASS designation and the removal of the HASS-D designation. Foremost, HASS courses should be as demanding as science/engineering courses. In addition, all courses designated "HASS" should require and emphasize:

- Regular writing or a major paper
- Regular reading
- Regular speaking in class
- Critical thinking

These activities should represent a significant portion of a student's grade. Classes excluded under this definition could alter their format to become HASS. Importantly, the HASS standard should not require a quantified amount of reading or writing, but instead emphasize regularity and quality of work. A meaningful and course-specific increased standard of rigor should increase the reputability of the HASS program and the seriousness with which students apply themselves.

At this increased level of academic rigor, the HASS-D designation becomes unnecessary. All courses that qualify as HASS should be categorized and included in the

distribution requirement. There should also be more distribution categories to bring emphasis to currently unrepresented fields – for example, Foreign Languages and Literatures – and subdivide over-reaching categories such as the current “Category 4.” This new organization should assuage the constrained feel of the requirement while maintaining breadth and rigor and increasing engagement through choice.

The SAC also recommends common freshman HASS/design experiences to further complement, enhance, and unify students’ first year experiences. Students would choose from a short list of 18-unit subjects combining the traditional attributes of HASS with interdisciplinary study and design. This design aspect could be similar to the Mission course in which extensive communication among students allows them to work toward an end goal with updates more formally presented along the way. These courses could be required and occupy the place of traditional advising seminars or they could be optional. They could be one semester or two, in different years or the same. Like HASS courses, such experiences would socially contextualize and intellectually complement the more narrow technical GIRs. Eighteen units would allow appropriate time for thorough work and underscore the importance of this particular experience and HASS courses in general.

IV. THE COMMUNICATION REQUIREMENT

Communication, in the form of reading, writing, discussing, and presenting, should be an integral part of an MIT undergraduate education. Holding the HASS program to a high communication standard provides students with a strong skill set useful for many different settings and topics and makes the CI-H requirement unnecessary.

Regardless, the Communication Requirement in its current form has several shortcomings:

- A restrictive set of minimum requirements for receiving CI designation (e.g. at least 20 pages of writing). Such specific requirements are not appropriate for every subject emphasizing communication and may actually lessen the quality of the experience.
- In some CI courses, communication is poorly taught and/or under-emphasized. Some classes do not focus on discussion enough to fit the ideals of the CI requirement, or lack rigor and thus are not taken seriously. Many courses are too large for professors to effectively evaluate and critique their students' communication abilities.

In addition, CI-H courses have two further shortcomings:

- The CI-H requirement complicates scheduling, and students therefore have an incentive to choose only classes that are both CI-H and HASS-D.

- Publishing the number of pages of reading and writing required for various CI-H classes leads students to select courses based on the amount of work classes are purported to require.

The current CI-M model seems to be fairly well-conceived. The SAC realizes the requirement is still in its trial period and thus its functionality should not be judged as severely as that of other more established requirements. Nevertheless, the model could be improved by requiring all students to take either a capstone-like class (e.g. 2.009) or, if that option is not feasible for the major, to write and present a thesis of original work. Many majors currently require a capstone project or thesis, but they should be standard throughout the Institute. Alternatively, all seniors (or last-year students, if graduating early/late) could participate in an interdisciplinary Mission-style course emphasizing problem-solving and thus communication between students from different majors and schools.

Finally, the Freshman Essay Evaluation (FEE) does not serve its purpose. Instead of testing a student's overall ability to write, the exam considers only one instance of writing. The same holds for AP English tests, which not only evaluate only one writing sample but also include multiple-choice questions and are subject-specific. Instead of serving as an absolute measure of whether or not a student must take a writing course, the FEE and APs should be used similarly to the math diagnostic, gauging each student's writing ability and helping him and his advisor choose appropriate classes for the freshman year. Advisors may recommend that students who scored poorly on the FEE/APs take a writing class, but this class should not be mandatory.

V. THE SCIENCE GIRS

The math and science General Institute Requirements (“science GIRs”) play a critical and defining role in an MIT education. These courses should:

- Provide an equal scientific foundation for all students.
- Create a common experience.
- Generate and sustain excitement and interest in a variety of technical fields.
- Prepare students to think at advanced levels for future coursework.

The science GIRs currently face the following problems:

- Strong engagement in the freshman year is lacking. Freshmen often feel overloaded, burnt out, and/or uninterested in their classes several weeks into the semester.

- Some material many consider fundamental is not covered, such as quantum mechanics, differential equations, engineering design and computation.
- Students do not retain enough of the material they are taught.
- There is little community, accountability, or interaction in these classes.

The TEAL format for teaching physics explicitly addresses the last of these problems by promoting small-group interaction and checking attendance. Students on the on-line forum, however, often comment that they did not learn best in this style. In our discussion and analysis, we did not focus on teaching methods for the GIRs, rather we concentrated on global changes to the GIRs.

To serve the above goals more effectively, the SAC suggests the following transformation of the science GIRs. Students must take six courses to fulfill the science GIRs with at least one course from each of five categories representing foundational topics in the sciences. Introductory technical courses are thus divided:

- Physics: classical and quantum mechanics, electromagnetism, statistical physics
- Mathematics: calculus, differential equations, linear & abstract algebra, real & complex analysis
- Biology: molecular and cell biology, evolution, genetics, biochemistry, ecology
- Chemistry: atomic/molecular theory, fundamentals of materials science
- Computation: fundamentals of computer languages, computational problem solving, limits to computation, algorithms and complexity

Students could receive credit and/or placement for satisfactory performances on advanced standing exams or AP tests, but instead of testing out of the GIR, they would have to take a more advanced MIT course in the field. All students must take six GIR classes at MIT.

Although discussed at length, we decided not to recommend a category devoted to “Engineering” under this plan. Although the majority of MIT students major in engineering, such a requirement would be outside the scope of core science GIRs and should arise through (a) departmental engineering programs, (b) engineering school-wide design courses, or (c) common design experiences similar to the current 2.000 or 16.00.

This category approach to the science GIRs gives students more flexibility, breadth, and ability to choose courses based on their interests and future plans. It includes additional classes vital in today’s scientific world. It maintains commonality among freshmen, as most would still take many classes together. Finally, it allows freshmen greater room for exploration of core scientific disciplines within the requirements.

VI. CONCLUSION

The General Institute Requirements are some of the most celebrated and defining features of an MIT undergraduate education. They are the common experience of all students and have profound influence on the freshman year and beyond. Any change to them should be made with care.

The greatest shortcoming of the current system is the apparent deficiency of student engagement in GIR subjects. Many factors affect this, several beyond the scope of this report, but four – the nature of advising, the HASS requirement, the Communication requirement, and the science GIRs – can be ameliorated. Fundamentally, we believe that allowing students to make choices and take responsibility keeps them engaged. Our recommendations for changing many of the requirements consequently promote choice. These recommendations also alleviate many of the complications and headaches of the current GIRs. They allow for more exploration and depth, as well as greater integration between subjects and opportunities for collaboration.

Finally, the SAC would like to acknowledge that it represents only a sampling of the undergraduate body and will endeavor to get widespread undergraduate feedback on this report to assess the level of support for these programs throughout the student body.

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