

**D'ARBELOFF FUND FOR EXCELLENCE IN EDUCATION
MIT TASK FORCE ON THE UNDERGRADUATE EDUCATIONAL COMMONS**

CALL FOR PRELIMINARY PROPOSALS

June 2005

Dear Colleagues:

The Task Force on the Undergraduate Educational Commons, in collaboration with the Office of the Dean for Undergraduate Education and the Alex and Brit d'Arbeloff Fund for Excellence in Education, is soliciting preliminary proposals for ambitious projects to enhance the first-year educational experience of our undergraduates. Over the past year and a half, the Task Force has undertaken a comprehensive review of the common educational experience of MIT undergraduate students. The focus of our review has been the 17-subject General Institute Requirements that are intended to offer a broad educational background that not only prepares students for more advanced studies in the majors but also expands their knowledge base in preparation for a lifetime of learning.

Early in our deliberations, the Task Force recognized that the freshman-year experience is key to helping our students develop a passion for learning that will endure throughout their stay at MIT and, indeed, throughout their lives. While acknowledging the educational effectiveness of subjects frequently taken by freshmen, many faculty have expressed the opinion that the freshman experience can be improved. While many ideas have been suggested in general terms, few specifics have been offered. With this Call for Proposals, we hope to stimulate the development of concrete educational experiments that can serve as models for future subject offerings outside the major programs. On the following pages we suggest three target areas:

- Project-based experiences;
- The freshman HASS experience;
- Broadening the science and engineering fundamentals.

Completed preliminary proposals are due by September 26, 2005. A subgroup of the Task Force on the Undergraduate Educational Commons, working with the d'Arbeloff Grants Committee, will review the preliminary proposals; applicants who pass the initial screening process will be invited to submit final proposals.



Robert P. Redwine
Dean for Undergraduate Education



Robert J. Silbey
Chair, Task Force on the Undergraduate
Educational Commons

GUIDELINES FOR PRELIMINARY PROPOSALS FOR 2005-06 EDUCATIONAL PROJECTS

Preliminary Proposals:

The preliminary proposal (2-3 pages) should explain the project's objectives, and how it relates to the areas of interest and the criteria outlined below. A rough estimate of the budget request should be included. The preliminary proposals should be sent to the Task Force in care of Peggy Enders (peggy@mit.edu) Room 6-201). Please contact Peggy (x3-3561) if you would like additional information.

Since the Committee on the Undergraduate Program (CUP) has the authority to approve limited educational experiments, the Task Force will work with the CUP in cases where a proposal for educational innovation with justified learning benefits may not conform strictly to current Institute program requirements.

If the scope of your project (e.g., relatively small number of students involved) suggests that it might not be appropriate for a d'Arbeloff grant, please keep in mind that in the coming year there will be a call for proposals issued for the Alumni Class funds to support educational initiatives.

Criteria:

Preliminary proposals are preferred for projects that include one or more of the following elements:

- **Motivation:** the project provides incentives for students and faculty to participate.
- **Collaboration:** The project stimulates interactions among faculty across departments or Schools and/or among faculty and other members of the extended MIT community, such as alumni/ae, close industrial partners, research scientists, partners at other institutions, and so on.
- **Impact:** The project can be expected to have national or global impact and contribute visibly to MIT's leadership role as a top-tier educational institution.
- **Sustainability:** the project will lead to long-term commitments by Schools and departments, with a result that it is likely to become a regular part of the MIT curriculum. For example, a project's long-term survival should not be dependent upon the continuing involvement of one or more key faculty or key students, and there should be a plan for sustainability after the initial d'Arbeloff funding terminates.
- **Scalability:** Initiatives that affect significant numbers of students are preferred. Initiatives that may be more practicable as small-scale projects, such as intense hands-on or apprenticeship experiences, should nonetheless be designed with scalability in mind.

Requirements and Restrictions:

- Participation in projects funded by these awards, whether participation is for compensation or as a volunteer, qualifies as "significant use" of MIT Administered Resources under MIT Policies and Procedures. In accordance with the treatment of "significant use," ownership of intellectual property, including copyrights in instructional materials and curriculum, will vest with MIT.
- For multiple year projects, funding commitments will be made on a year-by-year basis.
- The d'Arbeloff resources are intended primarily for faculty-led initiatives, with the understanding that many such initiatives may involve non-faculty participants.

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TASK FORCE ON THE UNDERGRADUATE EDUCATIONAL COMMONS

CALL FOR PRELIMINARY PROPOSALS
TARGET AREAS FOR 2005-06

1) New project-based experiences for first-year students, including curricular offerings across departments and Schools.

The Task Force is interested in proposals for new project-based experiences that:

- Provide students the opportunity to contribute to the definition of complex problems and to explore strategies for addressing them. (Most such problems require extended attention; reflection and refinement; and multiple modes of inquiry.)
- Explore current issues and challenges that define the cutting edge of 21st century scholarship. (Many such experiences provide an opportunity to explore fields outside the current core and to better inform choice of major.)
- Emphasize creativity. (Many project-based experiences are hands-on.)
- Provide a meaningful context for learning how to find, distill, and appropriately cite credible information. (The Libraries may be a good resource for advice and assistance in this area.)

Many successful models exist for project-based experiences – some involve integrative, team-based learning while others feature inquiry-based, discipline-specific individual work – but all have the essential elements of discovery and reflection that pervade research and learning activities at MIT. Project-based subjects involve design or creation and emphasize the synthesis of ideas and techniques. The outcome of a project-based subject is not narrowly prescribed in advance; definition of the problem is part of the process.

We envision project-based experiences that complement offerings in the Science-Engineering and HASS core programs. While there are a number of good examples of the sort of project-based experiences that interest us, the Task Force is interested in the development of additional project-based subjects that are accessible to first-year students, including those that provide students exposure to the impact of science and engineering on society. Some HASS subjects may lend themselves naturally to projects; others may lend themselves to integration with “design/build” experiences.

We are also interested in proposals for experiences that emphasize the importance of oral and written communication skills in design and project work (and that might possibly satisfy a portion of the Communication Requirement).

2) A more common first-year experience for students as a component of the requirement in the Humanities, Arts, and Social Sciences, which may take the form of coordinated subject offerings.

While the individual subject offerings in the Humanities, Arts, and Social Sciences (HASS) Requirement are excellent, the accumulated impact of these offerings may be less than optimal if we intend to equip our students for future leadership. The nature of MIT's undergraduate education is such that attitudes, values, and priorities for students are established quite early. Thus, the Task Force believes that significant attention needs to be paid to the importance of these subjects in the first year to signal their role in our educational program. Consequently, the Task Force is not interested in the establishment of new HASS subjects, *per se*, but in new ways to organize HASS subjects so that their visibility and priority are raised.

A common criticism of the various aspects of the HASS Requirement is that it is unproductively complicated. Therefore, we are especially interested in proposals that would allow the sub-goals of the HASS Requirement (i.e., Concentration and Distribution) and the Communication Requirement to be integrated into these classes.

Concretely, the Task Force is interested in proposals that may take the following forms:

- A collection of subjects taught around a single cultural or social theme. The theme should be broad and admit to a variety of disciplinary approaches. The subjects may be disciplinary or interdisciplinary in nature.
- Subjects that integrate strong humanistic or social scientific content into project-based offerings. (See previous text on "project-based offerings.")

3) The development of first-year subjects designed to provide broader coverage of the fundamental concepts and methods of modern science and engineering. These subjects may be the result of cooperative initiatives between departments and Schools.

Although the current Science Core provides an essential background in physics, chemistry, biology, and mathematics, it is the opinion of many in the MIT community that other essential concepts in modern science and engineering are absent from the General Institute Requirements. One way to overcome this deficiency is to expand the Science Core into a "Science-Engineering Core" that might include a menu of subjects such as computation, probability and statistics, and the analysis of complex natural or engineering systems. Such subjects should expose fundamental modes of inquiry in a way that clearly distinguishes the value of different mathematical, science, and engineering perspectives on problems.

In addition to our interest in proposals for subjects that might be suitable pilots for an expanded Core, the Task Force is interested in building upon the success of a number of recent initiatives to improve how such subjects are taught and integrated. We regard the TEAL experiments as successful examples of how educational innovation can lead to improvements in how effectively students learn traditional material. As teachers, we can focus more on providing students a sense of how the material they learn in the Core provides a foundation for future subjects, and we can do a better job of communicating the content of GIR subjects to instructors of "downstream" subjects so that they can refer back to – and thus reinforce – critical concepts. In problem sets and examinations, we can incorporate more timely, real-world examples of the value of basic science and engineering concepts in addressing societal problems.

N.B. Finally, there is often little motivation for faculty from different departments or schools to collaborate on the development of new subjects. Trends in student interests suggest that interdisciplinary learning may be a much more important part of an MIT education in the future. Proposals across all categories are solicited for the development of experimental subjects (or other types of educational experiences) that might illuminate best practices for interdisciplinary learning.