1.4 Promote interdisciplinary cooperation

Departments of mathematics should encourage and support faculty collaboration with colleagues from other departments to modify and develop mathematics courses, create joint or cooperative majors, devise undergraduate research projects, and possibly team-teach courses or units within courses.

The American Mathematical Society's report, *Toward Excellence*, urges departments to "Build strong relationships on campus. Faculty should make building strong relations with other departments and the campus administration a conscious department goal."

The response of the representatives of the partner disciplines at the Curriculum Foundation workshops indicated a surprising degree of willingness of faculty in other departments to work with mathematics departments on developing programs and courses and even team teach courses or units within courses. Without doubt, such interdisciplinary programs and courses are labor intensive. But they are needed because of the rapidly changing nature of the disciplines that use mathematics. In order to promote the creation of such programs and courses, mathematics departments should identify and encourage faculty who can be induced to invest the effort required to bring them about. Encouragement should include rewards such as release from other obligations, additional summer salary or professional development funds, and a clear indication that such activities are viewed favorably when tenure and promotion decisions are made.

Although development of interdisciplinary programs and courses costs money, the payoff can be enormous. Such interdisciplinary programs energize both the students and faculty who participate. They entice students from other disciplines to learn more mathematics and to learn it in a context that is important to them. And they open new ways of looking at mathematics for mathematics majors, including becoming aware of possible career options or avenues for further study. They provide an opportunity to communicate some of the cutting-edge work of mathematics. Interdisciplinary collaborations also enrich the faculty who participate, affording opportunities to learn--or relearn--powerful applications and ideas from other disciplines.

Joint efforts can cement relations between a mathematics department and the disciplines it serves. Lines of communication are kept open so that the mathematics department is sensitive to the needs and concerns of these partner disciplines. This has the paradoxical effect of reducing pressures on the department to conform to the wishes of others: It makes it easy to spot the small adjustments that can be most beneficial to the other discipline, and increases the awareness of other departments about what mathematics actually is doing.

When a department reaches out to and interacts with other departments, it sets an example that college and university administrators will recognize and encourage. Collaborations are more than a service to students and colleagues. They serve to enhance the visibility of a mathematics department so that it is properly seen as central to the mission of the entire institution.