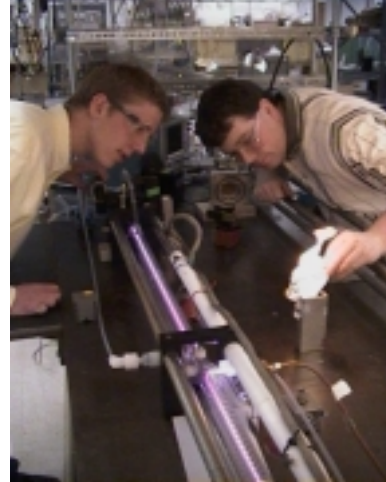


CASE STUDY: THE UNIVERSITY OF WISCONSIN-LACROSSE

The Setting:

Comprehensive, state-supported university with a total enrollment of 9,200 students of whom 8,500 are undergraduates. Capped admission has made academic preparation of students, largely from Wisconsin and Minnesota, second highest among institutions in the University of Wisconsin system. La Crosse is the center of a metropolitan area of 100,000 on the border of Wisconsin and Minnesota located 140 miles from Madison and 160 miles from Minneapolis.



The Department of Physics has seven tenure-line faculty, including an astronomer who is planetarium director, and two part-time faculty, a $\frac{3}{4}$ -time departmental secretary and a full time electronics technician.

The department graduates about 15 majors per year. About half graduate from La Crosse after the first year in engineering school on a 3/2 program. The majority of the others go to graduate school (most frequently in optics because of the department's research interests) and the others enter the workplace.

What Has Been Done:

1. The undergraduate physics curriculum has been completely overhauled.

The department has 3/2 programs with the University of Wisconsin campuses at Madison, Milwaukee and Platteville and with the University of Minnesota. Admission for students completing the required three-year curriculum at La Crosse with a high enough grade point average is automatic.

The upper-division curriculum introduces specialization early so students graduate in physics or in physics with emphasis in optics, computational physics, astronomy, biomedicine or business.

Students enter the major from the algebra-based introductory sequence as well as the calculus-based sequence. Their math skills even out by junior year, and the system allows all potential majors to immediately begin course work in physics and opens a much larger pool of introductory physics students to the department's recruiting efforts.

All laboratories have been reworked and equipped with computers and other modern equipment. Equipment from the sophomore level up is very modern and has the feel of a research lab.

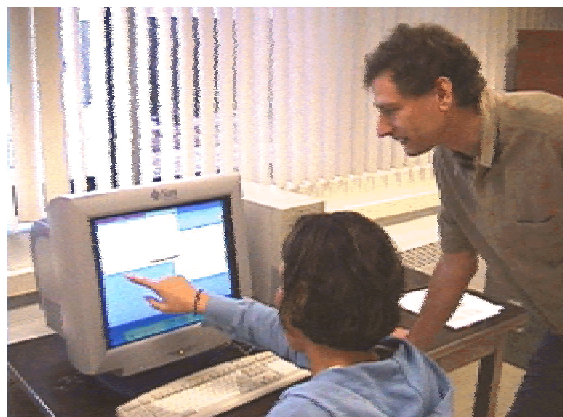
2. All majors are required to participate in research or some appropriate capstone experience such as student teaching and receive course credit for doing so. The college supports this undergraduate research initiative with student research grants, travel grants for students and summer fellowships.

Faculty actively recruit students to research projects beginning with their arrival on campus. Many students publish and make presentations at national and regional meetings.

Course loads are figured on the basis of contact hours so faculty receive load credit for working with undergraduate research. They are the only department in the university to do this.

3. All freshmen and sophomore physics majors are very strongly encouraged to enroll in a one credit hour seminar course.

This course, attended by 50 plus students and all faculty, is used as a primary means to build community in the department. The department provides information on research opportunities in and out of the department and brings in speakers from industry and the area to talk about using physics as a basis for a variety of careers.



4. The Physics Department aggressively recruits students and works to retain them once they arrive in the department.

They target likely physics majors for personal letters, award freshman scholarships, hold open houses for prospective majors and their parents, and present a very popular laser light show for middle school students. The department considers advising a critical element of students' success and works hard to provide each student with contact with a faculty advisor from the beginning. Students cite faculty mentoring and friendship as the best thing about their experience in the department.

5. The department runs summer workshops for in-service teachers and has created a physical science course for pre-service elementary teachers using inquiry-based instruction with no lectures. The pre-service course is so successful that other colleges would like to see it offered for their students even though the department does not have the personnel to do so.

6. The department pays attention to publicizing its programs within the university and the local community.

The chair has good working relationships with the local press who provide him with coverage for the department's activities. The department hosts an annual Distinguished Lecture Series in Physics which brings Nobel laureates to campus for the usual lectures in addition to a major banquet for local community and industrial leaders.

7. The faculty, particularly the chair, work to build community within the department.

Faculty members' assignments reflect their unique strengths. Junior faculty are mentored by senior faculty towards success in achieving tenure. Hires have been made carefully to strengthen the department and increase its morale.

Indicators of Success:

1. The department graduates 15 majors per year and this number continues to grow. In 1990, the department graduated about one major every other year.
2. The department's efforts are respected and supported by all levels of administration.
3. Two faculty members have won teaching awards in the last few years.
4. Faculty and students are actively publishing and presenting papers at meetings. Many faculty papers have student co-authors.
5. Students leave the program positioned for success in graduate programs and in engineering schools.
6. The department works as a team with a shared sense of mission and a real respect for one another's contributions to the work of the department.

Keys to Making the Changes:

1. The Physics Department has enjoyed sustained administrative support. Revitalization of the department began when the Dean brought in an outside chair and another experienced faculty member. The administration invested resources to attract good people and to provide them with the tools they need to make effective changes.
2. The department chair provides very skillful personal leadership to the department. He leads by example, works to build consensus within the department and enjoys great respect from university and college administrators.
3. The department works hard to build a common sense of mission and to use limited resources and people in the most effective way possible.
4. Curricular revisions have been carefully designed to meet the needs of students and are revised in response to student feedback. The department chair assigns the very best teachers to the introductory courses.
5. The department's increased emphasis on research has not diminished its focus on excellent teaching. All faculty consistently demonstrate a genuine concern for students that is recognized by the students.