Strategic Planning for the Graduate Program
January 20, 2006

Introduction:

The following general principles set the tone for our Graduate Program:

- **We are a large Group I research department in a large state university.** As a first rate research department we should be training the next generation of research mathematicians. We should recruit students for whom this is a realistic prospect and expect significant numbers to attain this goal. As part of a large state institution, we also take a broad view and recognize the full range of career options for Mathematics Ph.D’s.

- **There’s more to graduate school than the formal requirements.** Preparation for a career in mathematics takes more than formal course work and writing a thesis. Students must absorb the culture of their field and establish links within it. Students automatically get some of this simply by showing up and hanging around, but we can and should do more to facilitate the requisite acculturation.

- **Mathematicians share a passion for their subject.** One of the remarkable features of mathematics is that essentially without exception, all who call themselves mathematicians are enthralled by the subject. Mathematicians describe the subject in aesthetic terms and talk about its beauty. The statements in the applications submitted by our graduate students demonstrate clearly the same appreciation. Our graduate program should encourage students to indulge their passion for the subject and keep the flame burning.

Goals

General goals

- Train the future stewards of the mathematical discipline
- Enliven and sustain the research environment in the Department
- Support the undergraduate educational mission of the Department

Specific tasks toward our goals

- Develop useful, comprehensive database of alumni
- Improve recruitment methods and outcomes
- Improve mentoring and progress review
- Improve student transition from course work to research
- Improve outcomes: better placement of alumni, realization of full potential
- Improve student sense of belonging and integration into Department research life
- Reduce attrition/time to non-degree
- Reduce time-to-degree (to less than 6 years)
- Expand multi-disciplinary opportunities and promote joint-advisor arrangements
- Provide Office/desk space for all students
- Increase summer funding; support RAPS and REGS.
- Increase non-TA funding/reduce teaching load of students
- Enhance career preparation
- Improve mentoring for graduate students by faculty and post-docs; encourage mentoring by graduate students for undergraduate students.
• Review the menu of regularly scheduled courses;
• Expand and strengthen mini-course program

Competitive Analysis

Departments of comparable size and academic standing at flagship State Universities:

• UC Berkeley (70 regular faculty)
• U Michigan Ann Arbor (70)
• U Wisconsin Madison (60)
• UT Austin (60),
• UCLA (55)
• Ohio State University (112 regular + emeritus)
• U Maryland College Park (63)

(Other competitors include Rutgers, Penn State, Stony Brook, UCSD, U Minnesota)

SWOT Analysis

Strengths:

• High quality of faculty and research environment, including a large number of active young faculty.
  • Size and scope of the program
  • Exceptional library and other information resources
  • Graduate students from other departments are attracted to our courses.
  • Integration of postdoctoral program with graduate program
  • Authors of well-known graduate texts are counted among our faculty.

Weaknesses:

• Insufficient research culture, too much TA culture
• Inadequate funding (especially for summer, and in non-TA form)
• Heavy teaching load of faculty leaves insufficient time for graduate advising.
• Lack of incentives for faculty involvement in graduate training.
• Weak recruiting
• Long Term Outcomes of our Graduate Alumni less successful than we wish.
• Non-uniformity of research involvement and mentoring across areas.

Opportunities:

• Forge new links with other parts of campus
• Joint bioinformatics PhD initiative
• Strengthen existing links, such as in cryptography, physics, etc.
• Innovative Masters programs
• Outreach, Recruiting opportunities (REU’s, etc.)

Threats:
• Shrinking pool of excellent candidates, especially international
• Loss of VIGRE-inspired innovations (REGs, RAPs)
• Declining research career prospects due to shrinking funding.
• Changing funding and job opportunities.
• Failure of recent graduates to attain prominence will harm reputation of program.
• Lack of incentives for faculty involvement in interdisciplinary initiatives.

Distinctive Competencies

Campus:
• Size, quality, and diversity of research establishment
• Quality-of-life

Differentiation from competition:
• Excellent library
• Commitment to program assessment (participation in CID and CGS study on attrition, Alumni Visiting Committee, VIGRE assessment, etc.)

Most Promising Interdisciplinary Areas

• Engineering
• Physical sciences
• Biological sciences
• Cryptography and information science
• Financial mathematics

Factual Information

(attached)

Final Comments

The following remarks address important aspects of the graduate program and its relation to the rest of our Departmental mission:
• Strong and focused hiring has an important impact on the graduate program: it improves recruitment of graduate students as well as the research environment for them.
• We have not yet addressed a key question: “What is the optimum size of our graduate program?”.
• Our participation in the Carnegie Initiative on the Doctorate, our VIGRE grant from NSF, various site visits (NSF, Alumni Visiting Committee, etc.) and many special programs (REGS, Math 499, Distinguished Lecture Series, etc.) show that we have been actively and effectively evaluating our Graduate Program. This level of self-evaluation help distinguish us from many peer institutions.