



UNIVERSITY OF WASHINGTON
The Graduate School
G-I Communications
Box 353770
Seattle, Washington 98195-3770

Telephone: (206)543-5900
Fax: (206)685-3234

November 18, 2016

To: Robert C. Stacey, Dean
College of Arts and Sciences

From: David Eaton, Vice Provost and Dean
Rebecca Aanerud Associate Dean for Academic Affairs and Planning,
The Graduate School

RE: Review of the Department of Mathematics 2015-2016 Review

This memorandum outlines the Graduate School's recommendations on the Department of Mathematics program review. Detailed comments on the review can be found in the documents that were part of the following formal review proceedings:

- Charge meeting between review committee and administrators (October 14, 2015)
- Self-Study (February 1, 2016)
- Site visit (February 25-26, 2016)
- Review committee report (April 27, 2016)
- Mathematics response to the report (June 13, 2016)
- Graduate School Council consideration of review (November 3, 2016)

The review committee consisted of:

Paul Hopkins, Professor, UW Department of Chemistry (Committee Chair)
Paula Heron, Professor, UW Department of Physics
Zelda Zabinsky, Professor, UW Department of Industrial and Systems Engineering
Aaron Bertram, Professor, Department of Mathematics, University of Utah,
Salt Lake City, UT
Robert Fefferman, Max Mason Distinguished Service Professor of Mathematics,
Department of Mathematics, University of Chicago, Chicago, IL
Irene Fonseca, Professor, Department of Mathematical Sciences, and Director,
Center for Nonlinear Analysis, Carnegie Mellon University, Pittsburgh, PA

The Department of Mathematics offers the following degrees:

Bachelor of Arts (3 program options—Standard, Teacher Preparation, and
Philosophy)
Bachelor of Science (2 program options—Comprehensive and Standard)

Bachelor of Science in Applied and Computational Mathematical Sciences
Master of Science and Doctor of Philosophy

Members of the Graduate School Council presented findings and recommendations to the full Council at its meeting on November 3, 2016. A summary of this report, composed by Graduate School Council Members, is attached to this document.

We concur with the Council's recommendations noted in the attached summary.

cc: Gerald Baldasty, Provost and Executive Vice President, Office of the Provost
Patricia Moy, Associate Vice Provost for Academic and Student Affairs,
Office of the Provost
Suzanne Hawley, Divisional Dean of Natural Sciences, College of Arts and Sciences
Jason Johnson, Associate Dean, Undergraduate Academic Affairs
Mathematics Review Committee
Graduate School Council
Augustine McCaffery, Senior Academic Program Specialist, Academic Affairs and
Planning, The Graduate School

Attachment: Graduate School Council Review Summary

Graduate School Council Discussion

Academic Program Review

November 3, 2016

Professor Michael Brown, Department of Earth and Space Sciences and
Dan Turner, Associate Dean, Master's Programs, Foster School of Business

Academic Unit Name: University of Washington Department of Mathematics

Degrees/Certificates Included in the Review: Bachelor of Arts (3 programs/options—Standard, Teacher Preparation, and Philosophy), BS (2 programs—Comprehensive, Standard), joint BS in Applied and Computational Mathematical Sciences, Master of Science (MS), and Doctor of Philosophy (PhD).

Program Strengths:

1. Substantial growth in interest in mathematics offerings in undergraduate service courses, in majors, and in the PhD Program indicates quality development experiences being offered by the department through its courses. The department has addressed quality challenges in the calculus courses noted in the prior review while also growing the number of students served. The PhD program is recognized as being of exceptional quality.
2. Faculty research quality remains high in the eyes of both the department and the visiting team.
3. The departmental governance structure is strong and features numerous, active functional committees. Participation is balanced between younger and more senior faculty, and younger faculty are deemed ready to take more senior leadership roles in the department's governance.
4. The grant- and donor-funded outreach to K-12 performed by members of the department is exemplary.
5. All members of the Department of Mathematics community—faculty, staff, and students—express high levels of satisfaction with their experiences in the community.

Challenges & Risks:

1. The tremendous growth in student interest (particularly in the undergraduate ranks) is not mirrored by an increase in tenure track faculty. Tenure track faculty positions have fallen by 5 since the last review (from 49 to 44); conversely, degrees granted have risen by approximately 150% over the same period, and enrollment in 2 key service course series are up 50% and 100% over the same period. Consequently, the department deploys many doctoral students in teaching roles (particularly in service courses at the 300 level) as well as several postdoctoral acting assistant professors.
2. The age distribution of tenure track faculty is heavily skewed toward the higher end with a disproportionate share of professors within a decade of likely retirement; the department features 16 faculty over the age of 60, and 1-2 faculty are expected to retire per year for the foreseeable future.

3. The department has chosen a structure of small class sizes with many sections, thereby exacerbating the issues related to shortage of tenure track faculty.
4. Deployment of tenure track faculty and lecturers is disproportionately tilted away from 300 level courses such that most of those courses are led by teaching assistants, post-doctoral associates, and part-time lecturers. Given typical transition patterns among those latter faculty types, this deployment puts into question the sustainability of quality instruction in these courses over time.

Areas of Concurrence:

1. The department and Review Committee exhibit broad general agreement across most program strengths and challenges
2. The department has signaled interest in moving in directions recommended by the visit team, e.g., larger class sizes supported by TA sections, fewer doctoral students in primary teaching roles, increasing extrinsic reward to tenure track faculty for teaching 300-level classes, etc. However, it is not clear that the department has a sustainable plan to staff courses in this way given current resource constraints, and it is not clear that additional University-provided resources will be forthcoming.

Graduate School Council Recommendations:

The Graduate School Council commends the Department of Mathematics on the strength of its programs, faculty, and students. The Council notes the strain that enrollment growth coupled with tenure track faculty losses places on the Department; the Council commends the faculty and staff's efforts to deploy resources in a manner that best matches the development goals of students and encourages faculty and staff to continue on this path.

After discussion, the Council recommended continuing status for the Department's undergraduate and graduate degree programs, with the next review to occur in the 2025-2026 academic year.