

with the candidate, the Chair decides what materials should be sent to each evaluator. Generally, the outside evaluators are sent a cover letter, a brief vita of the candidate, copies of the candidate's recent publications, and a copy of the Department's tenure and promotion criteria. The evaluators are asked to comment on the quality and significance of the candidate's work.

The candidate submits a list of varied students to fill out the student form (for example, majors and non-majors, students from introductory, advanced, and graduate courses, advisees as appropriate). The Chair makes a list of student evaluators. At the Chair's discretion, the Chair may consult appropriate faculty in selecting student evaluators. The Chair chooses two students, one from the candidate's list and one from the Chair's list. To provide adequate coverage of the candidate's work in teaching and advising, additional student letters may be solicited after consultation with the candidate.

The candidate submits a list of faculty (one or more) to fill out the colleague form. The

College of Arts and Sciences in the *College Policy Binder*, section II.A.6. This document further interprets and applies those criteria to the Department of Mathematics and Computer Science.

The criteria for promotion are in the areas of teaching, advising, scholarship and research, service, skill and knowledge of the field, and collegiality. Satisfactory performance is required in each area. Of these, teaching and research/scholarship are the most important. Good teaching is absolutely essential, and each university professor must be a scholar.

Criteria for Promotion to Associate Professor with Tenure

- **Teaching**

Faculty members seeking promotion and/or tenure should demonstrate success in teaching a variety of courses appropriate to their backgrounds and the needs of the Department.

Curriculum development and the supervision of undergraduate research projects, master's theses, and doctoral dissertations are considered contributions to teaching.

Indicators of teaching quality may include (but are not necessarily limited to) the responses to quantitative and open-

books or conference proceedings. Publications that result from collaborative work with researchers in other disciplines count towards tenure and promotion, whether they appear in mathematics, computer science and statistics journals or in journals in other

ⁱ For the benefit of administrators and members of the College Committee on Rank, Tenure, and Sabbaticals and of the University Committee on Academic Rank and Tenure, we provide the following comments about publication norms and practices in mathematics, computer science and statistics. The National Research Council's 2006 study, *A Data-Based Assessment of Research-Doctorate Programs in the United States (revised 5/3/2011)*, contains data about publication rates in Ph.D.-granting departments in the natural, physical, mathematical, and social sciences. In the 127 mathematics doctoral programs surveyed, the number of publications per faculty member ranged from about 0.3 per year to about 1.9 per year. For 128 programs in computer science, the range was from about 0.2 to about 4.5. For 61 programs in probability and statistics, the range was from about 0.1 to about 2.3. The comparable figures for some other disciplines were: 0.1 to 8.0 (chemistry); 0.3 to 5.0 (cell and developmental biology); 4.5 to 34.5 (philosophy); 4.8 to 23 (history); and 0.0 to 2.9 (psychology). After taking into account the Department's heavy commitment to its teaching mission, we conclude that a publication rate of approximately one paper every one or two years is an appropriate objective for a mathematician or computer scientist at Saint Louis University. A candidate who has maintained that rate would merit attention among recognized scholars in mathematics, computer science and statistics.

A study published in the *Notices of the American Mathematical Society* shows that, among those who published mathematics research papers during the period from 1940 through 1999, only 25% published six or more papers [See Jerrold W. Grossman, "Patterns of Research in Mathematics", in *Notices of the American Mathematical Society*, Vol. 52, No. 1 (Jan., 2005), pp. 35-41].

In mathematics, computer science and statistics, both singly and jointly authored papers are common. According to Grossman's study, about 2/3 of the mathematics research papers published between 1940 and 1999 had only one author, and about 1/3 were jointly authored. Fewer than 1/10 of the papers had more than two authors. More recently, during the 1990s, about 54% of the papers had only one author, and about 13% had more than two authors.

In mathematics and computer science, the order in which the authors of a jointly authored paper are listed ordinarily conveys no information about the relative importance of their contributions to the paper. Professional guidelines stipulate that all of the listed authors "must have made a significant contribution to [the paper's] content" (See "Ethical Guidelines for the Society," in *Notices of the American Mathematical Society*, Vol. 51, No. 6 (June/July, 2004), pp. 675-677.). Authors are often listed alphabetically, by surname, and sometimes they may be grouped by institutional affiliation. This convention does not necessarily apply to articles that are co-authored with researchers in other disciplines. According to "Ethical Guidelines for Statistical Practice" from 1999 (<http://www.amstat.org/about/ethicalguidelines.cfm>), "authorship order in statistical publications should be by degree of intellectual contribution to the study and material to be published, to the extent that such ordering can feasibly be determined. When some

