

Fall 2013 Departmental Profile Report

William Yslas Vélez, James W. Maxwell, and Colleen A. Rose

This report presents a profile of mathematical sciences departments at four-year colleges and universities in the United States, as of fall 2013. The information presented includes the number of faculty in various categories, undergraduate and graduate course enrollments, number of bachelor's and master's degrees awarded during the preceding year, and the number of graduate students. A description of the faculty categories used in this report is provided at the end of this report (page 414).

Data collected earlier from these departments on recruitment, hiring and faculty salaries were presented in the Report on 2012-2013 Academic Recruitment and Hiring (pages 744-749 of the August 2014 issue of *Notices of the AMS*) and the 2012-2013 Faculty Salaries Report (pages 611-617 of the June/July 2014 issue of *Notices of the AMS*).

Detailed information, including tables which traditionally appeared in this report, is available on the AMS website at www.ams.org/annual-survey/survey-reports.

Faculty Size

The estimated number of full-time faculty in all departments for fall 2013 is 24,290 with 22,115 of these in all mathematics departments combined (Math Public, Math Private, Applied Math, Masters, and Bachelors), down slightly from 22,219 last year. Full-time faculty among the doctoral mathematics departments combined (Math Public, Math Private, and Applied Math) increased slightly to 8,653 from 8,634 last year. In the mathematics departments combined we estimate the number of nondoctoral full-time faculty is 3,803, up 3% from last year's estimate of 3,692, with a standard error of 105 for our 2013 estimate. The total part-time faculty in all mathematics departments combined is estimated to be 7,795 (with a standard error of 216), up 13% from 6,907 last year.

Figure F.1: Full-time Faculty by Department Grouping

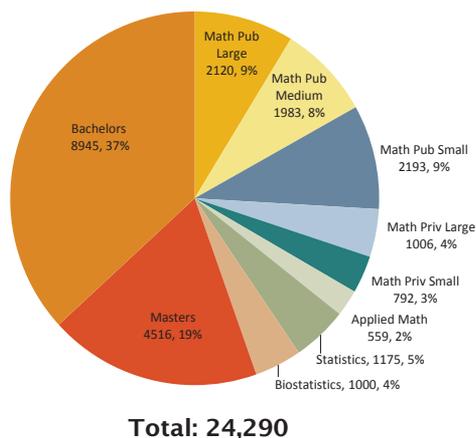


Figure F.2: Full-time Doctoral Faculty by Department Grouping

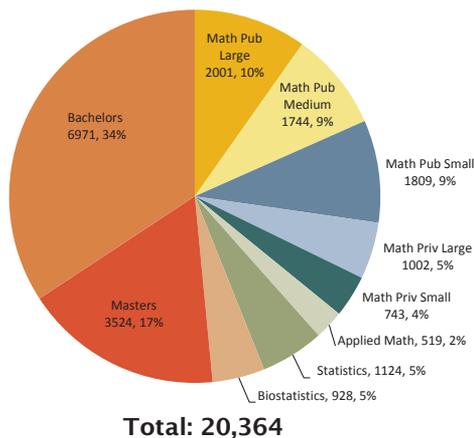
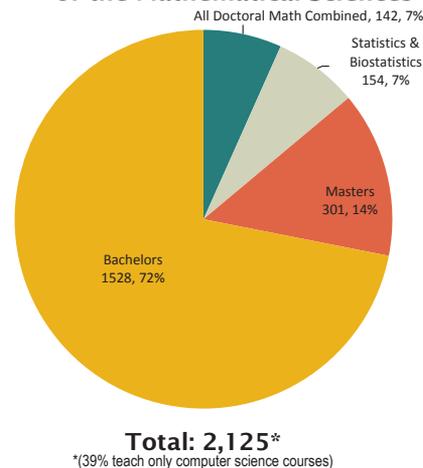


Figure F.3 Full-time Faculty Teaching Courses Outside of the Mathematical Sciences

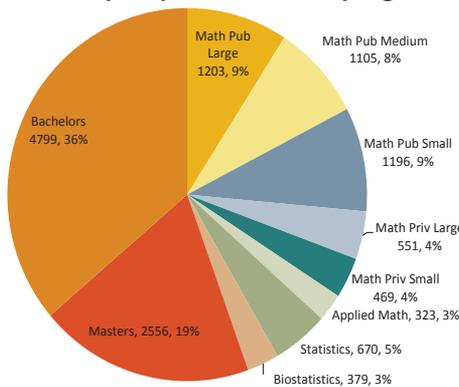


William Yslas Vélez is a professor in the Department of Mathematics at University of Arizona. James W. Maxwell is AMS coordinator of special projects. Colleen A. Rose is AMS survey analyst.

Doctoral Faculty

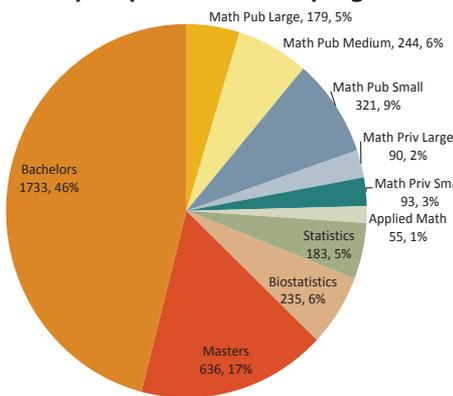
The estimated number of full-time doctoral (i.e. doctorate-holding) faculty in all mathematics departments combined (Math Public, Math Private, Applied Math, Masters, and Bachelors) is 18,312 (with a standard error of 105), down slightly from last year's number of 18,527. For these same groups combined, total doctoral tenured faculty remained essentially unchanged at 12,202 compared to 12,183 for fall 2012; 39% (4,799) of all doctoral tenured faculty are in Bachelors departments. (See page 166 for a full description of faculty categories.)

Figure D.1: Full-time Tenured Doctoral Faculty by Department Grouping



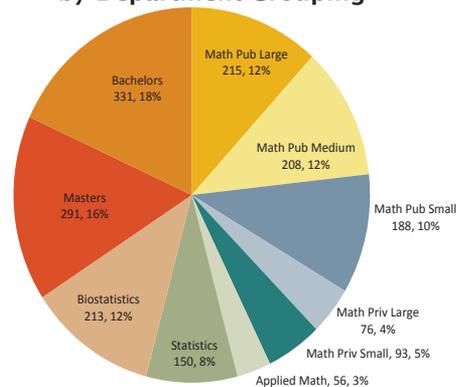
Total: 13,251

Figure D.2: Full-time Tenure-eligible Doctoral Faculty by Department Grouping



Total: 3,770

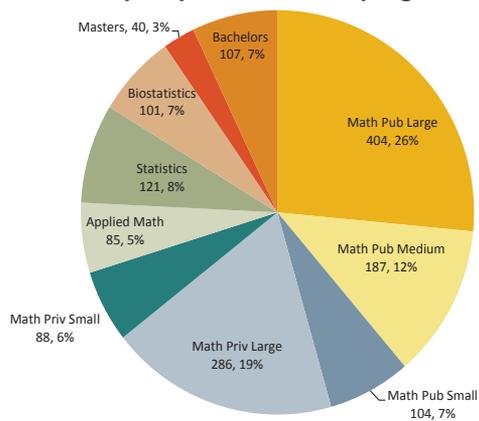
Figure D.3: Full-time Non-tenure-track Doctoral Faculty (excluding Postdocs) by Department Grouping



Total: 1,821

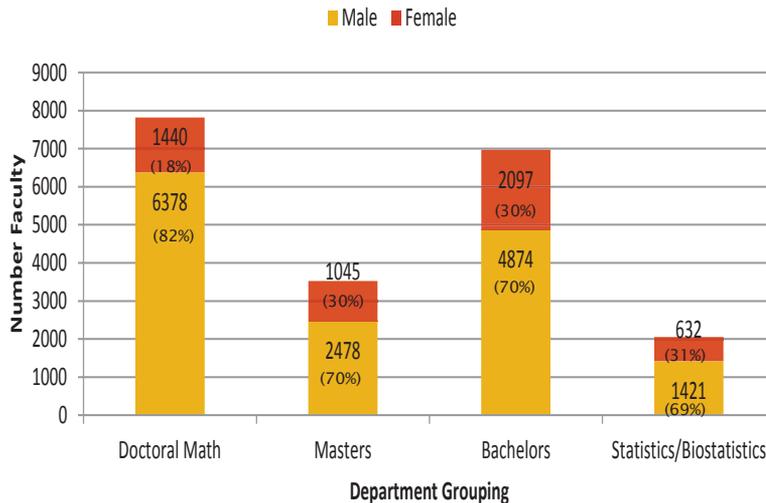
- Postdoctoral appointments among the doctoral mathematics departments combined (Math Public, Math Private, and Applied Math) increased to 1,154 for fall 2013. This is a 6% increase from last year and 15% of the total full-time doctoral faculty in these departments.
- Females hold 21% of all postdoctoral appointments.
- Part-time doctoral faculty increased 21% to 579 in all doctoral mathematics departments combined; this is 43% of all part-time faculty in these groups.
- Females hold 27% of all part-time doctoral faculty positions.

Figure D.4: Full-time Postdoctoral Faculty by Department Grouping



Total: 1,522

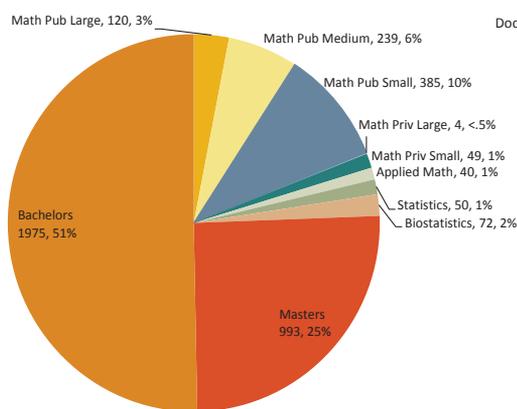
Figure D.5: Gender of Full-time Doctoral Faculty Total: 20,364



Nondoctoral Faculty

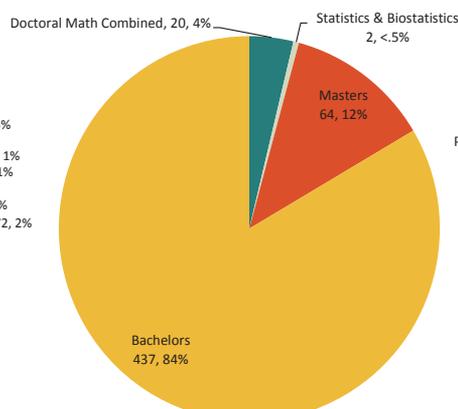
The estimated number of nondoctoral (i.e. without a doctorate) full-time faculty in all mathematics departments combined (Math Public, Math Private, Applied Math, Masters, and Bachelors) is 3,803. This is up 3% from last year and is 17% of all full-time faculty (22,115) in these departments. In addition, nondoctoral tenured faculty decreased 18% from 633 to 521 this year. 193 of the nondoctoral faculty in all mathematics departments are tenure-eligible faculty, 5% of all tenure-eligible faculty in these groups. Nondoctoral full-time non-tenure-track faculty increased 8% to 3,074; this is 81% of all nondoctoral mathematics faculty.

Figure ND.1: Full-time Nondoctoral Faculty by Department Grouping



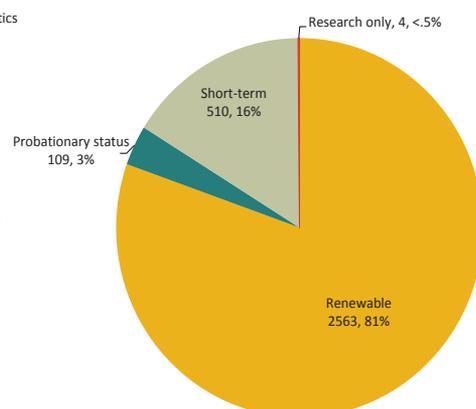
Total: 3,925

Figure ND.2: Full-time Nondoctoral Tenured Faculty by Department Grouping



Total: 524

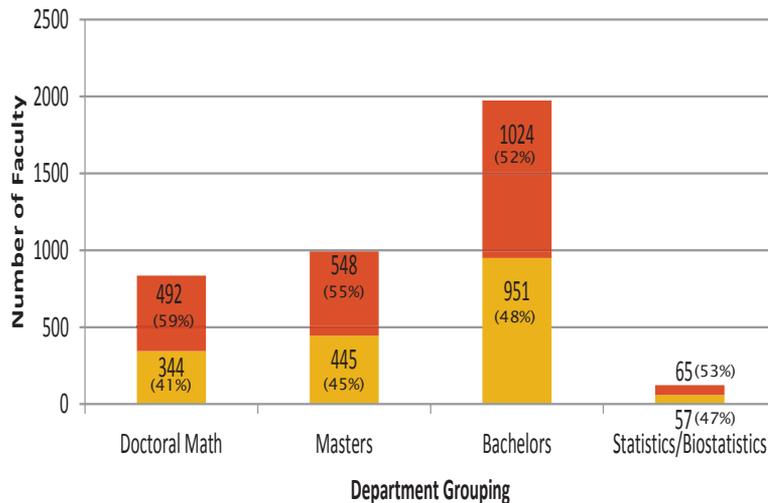
Figure ND.3: Full-time Nondoctoral Non-tenure-track Faculty by Type of Appointment (excluding Postdocs)



Total: 3,187

Figure ND.4: Gender of Full-time Nondoctoral Faculty Total: 3,925

■ Male ■ Female

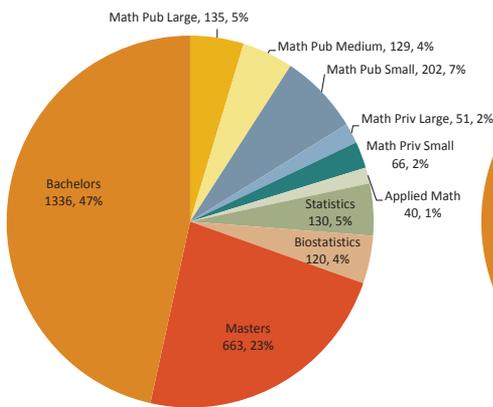


- 81% of all nondoctoral non-tenure-track faculty appointments are renewable, with probationary, short-term, and research only appointments comprising 3%, 16%, and <.5%, respectively.
- Females account for 54% of full-time nondoctoral faculty in all mathematics groups combined (up from 53% last year), compared to females accounting for 26% of all doctoral full-time faculty and 30% of all full-time faculty.
- Total part-time nondoctoral faculty increased 16% to 6,149 from 5,288 last year.
- Part-time nondoctoral faculty increased 9% to 755 in all doctoral mathematics departments combined (Math Public, Math Private, and Applied Math), this is 57% of all part-time faculty in these groups.
- Females hold 46% of all part-time nondoctoral faculty positions.

Female Faculty

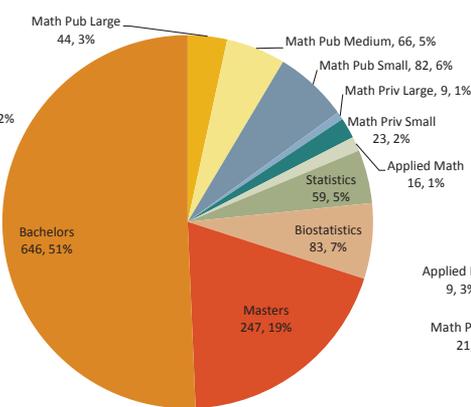
For the combined mathematics departments (Math Public, Math Private, Applied Math, Masters, and Bachelors), women comprised 30% (6,647 with a standard error of 101) of the full-time faculty (22,115) in fall 2013. For the doctoral mathematics departments combined (Math Public, Math Private, and Applied Math), women comprised 15% of the combined doctorate-holding tenured and tenure-eligible faculty and 29% of the doctoral-holding non-tenure-track (including postdocs) faculty in fall 2013. For Masters faculty these same percentages are 29 and 41, and for Bachelors faculty they are 30 and 26, respectively. Among the nondoctoral full-time faculty in all math departments combined, women comprise 54%. Females account for 39% of all part-time faculty in mathematics departments combined.

Figure FF.1: Full-time Tenured Female Doctoral Faculty by Department Grouping



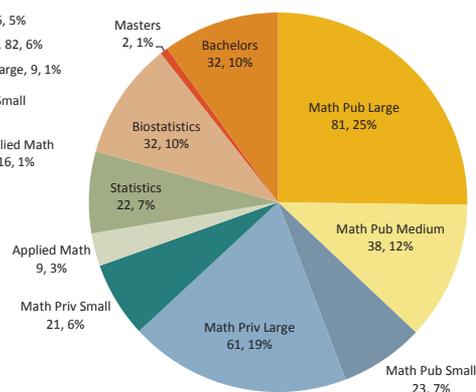
Total: 2,871

Figure FF.2: Full-time Tenure-eligible Female Doctoral Faculty by Department Grouping



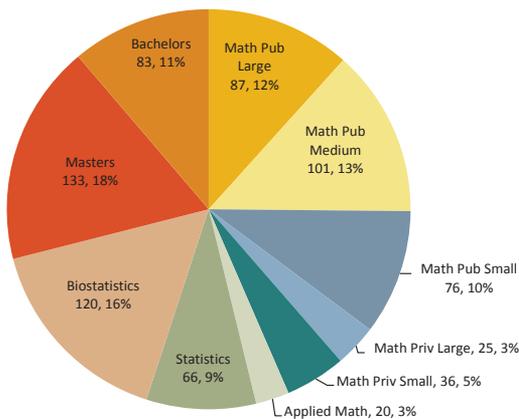
Total: 1,275

Figure FF.3: Full-time Postdoctoral Female Doctoral Faculty by Department Grouping



Total: 322

Figure FF.4: Full-time Female Doctoral Non-tenure-track Faculty (excluding Postdocs) by Department Grouping



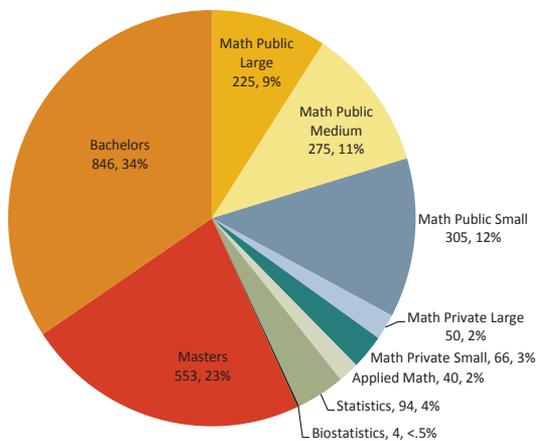
Total: 747

- Females hold 13% of full-time tenured and 24% of full-time tenure-eligible positions in all doctoral mathematics departments combined.
- 43% of all full-time female faculty (in all groups combined) are in the Bachelors Departments.
- Biostatistics departments reported the highest percentage of full-time female faculty (39%), followed by Masters and Bachelors departments (35% each), while Math Private Large reported the lowest (15%).
- Females hold 21% of all postdoctoral appointments. 36% of all female postdocs in doctoral mathematics departments combined are found in Math Public Large departments. This group reported the highest percentage (26%) of female postdocs.
- 84% of all female nondoctoral non-tenure-track faculty appointments (1,791) are renewable, with probationary, short-term, and research only appointments comprising 3%, 13%, and < .5%, respectively.
- 59% of all part-time female faculty among the mathematics departments combined are found in the Bachelors Departments.
- 89% of all part-time female faculty hold nondoctoral positions.

Undergraduate Course Enrollments

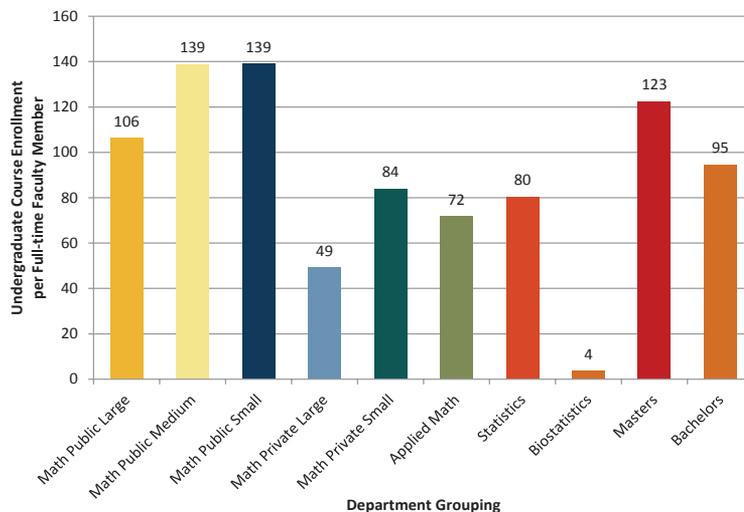
Total undergraduate enrollments for all groups combined increased by 2% (53,000) to 2,460,000 (with a standard error of 20,000). All departments combined reported an overall increase of 2% in the number of undergraduate course enrollments per full-time faculty member.

Figure UE.1: Undergraduate Course Enrollments by Department Grouping



Total Undergraduate Enrollments (thousands): 2,460

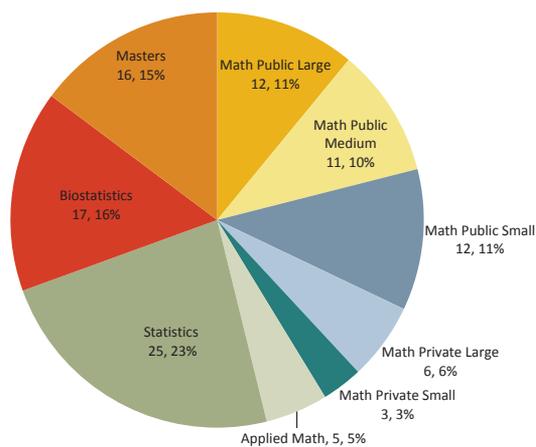
Figure UE.2: Undergraduate Course Enrollment per Full-Time Faculty Member, Fall 2013



Graduate Course Enrollments

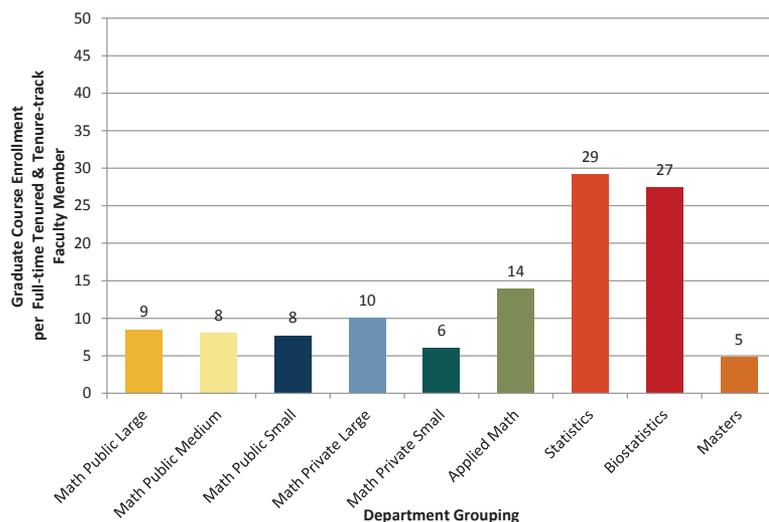
Total graduate course enrollments have increased slightly from 106,000 to 108,000 (with a standard error of 3,000). All departments combined reported an overall increase of 1% in the estimated number of graduate course enrollments per full-time tenured and tenure-eligible faculty member.

Figure GE.1: Graduate Course Enrollments by Department Grouping



Total Graduate Enrollments (thousands): 108

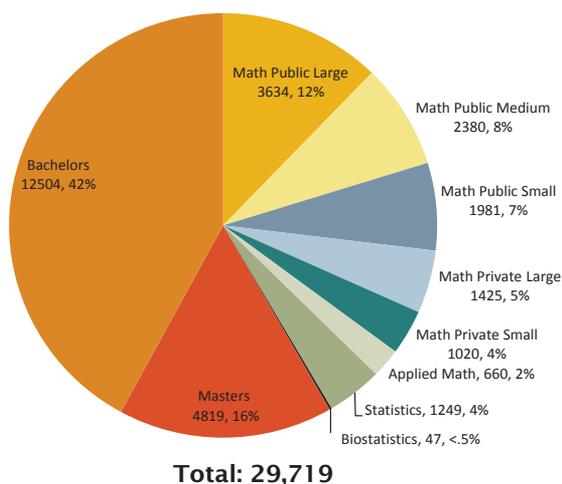
Figure GE.2: Graduate Course Enrollment per Full-Time Tenured and Tenure-eligible Faculty Member, Fall 2013



Undergraduate Degrees Awarded

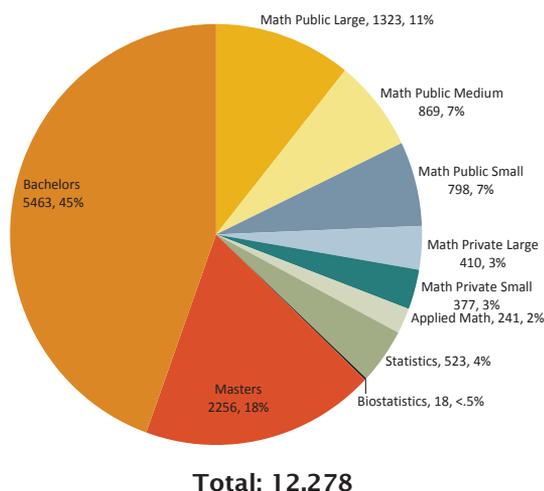
The estimated number of undergraduate degrees awarded during 2012–2013 by all mathematics departments combined (Math Public, Math Private, Applied Math, Masters, and Bachelors) is 28,423 (with a standard error of 361), up 6% from last year’s estimate of 26,761. Females earned 41% (11,737) of undergraduate degrees, up 10% from last year. This year’s estimated number of undergraduate degrees awarded by mathematics departments included 611 statistics-only and 1,811 computer-science-only.

Figure UD.1: Undergraduate Degrees Awarded* by Department Grouping



* Degrees awarded between July 1, 2012 and June 30, 2013.

Figure UD.2: Undergraduate Degrees Awarded* to Females by Department Grouping

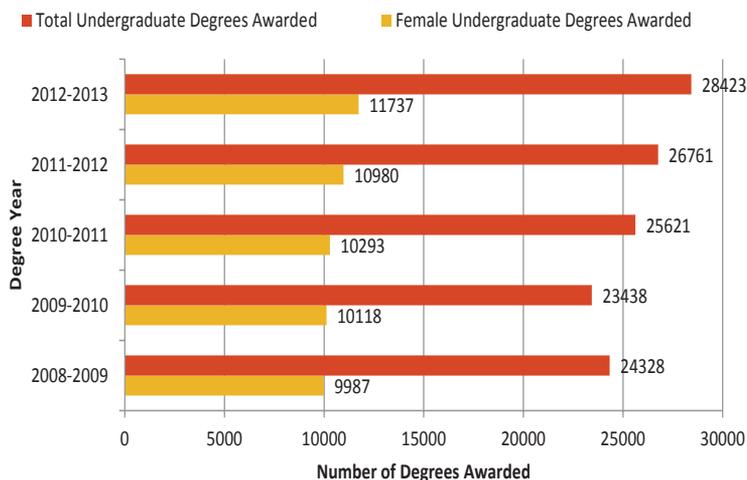


* Degrees awarded between July 1, 2012 and June 30, 2013.

- Math Doctoral departments awarded 8% more degrees this year, up 838 from last year, 37% of all degrees awarded.
- All groups showed an increase in the number of degrees awarded except Statistics, which decreased 7%.
- Math Public Small departments showed the largest increase in degrees awarded, up 14% from last year.
- Bachelors departments awarded 42% of all the degrees, the same as last year, in all mathematics departments combined.
- Total statistics-only degrees increased in all mathematics departments combined by 28% to 611.
- 80% of computer sciences degrees were awarded by Bachelors departments.
- Statistics and Biostatistics departments combined awarded 1,296 degrees, a decrease of 6% from last year; females received 42% of these degrees (up from 41% last year).

- 41% of all degrees awarded were to females, the same as last year.
- All groups reported an increase in the number of degrees awarded to females except Math Private Small and Statistics, which reported decreases of 5% each.
- Math Doctoral departments awarded 34%* of all degrees awarded to females. ***Note: The published report incorrectly cited this as 9%.**

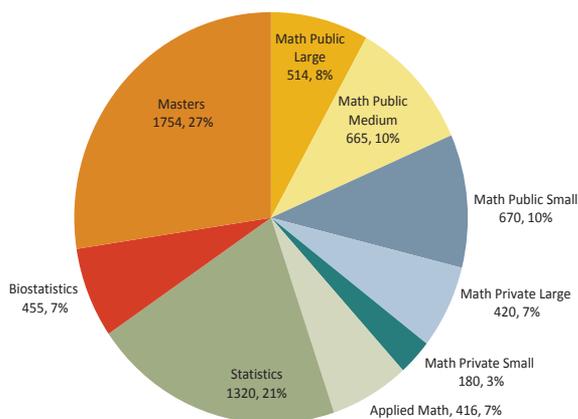
Figure UD.3: Undergraduate Degrees Awarded All Mathematics Combined



Master's Degrees Awarded

The estimated number of master's degrees awarded during 2012-2013 in all mathematics departments combined (Math Public, Math Private, Applied Math, and Masters) is 4,619, a 6% increase from last year's estimate of 4,370 (with a standard error of 136). These departments also reported a slight increase in the number of degrees awarded to females, 1,735. This year's total estimated graduate degrees included 2,207 statistics-only and 87 computer-science-only degrees.

Figure MD.1: Master's Degrees Awarded* by Department Grouping

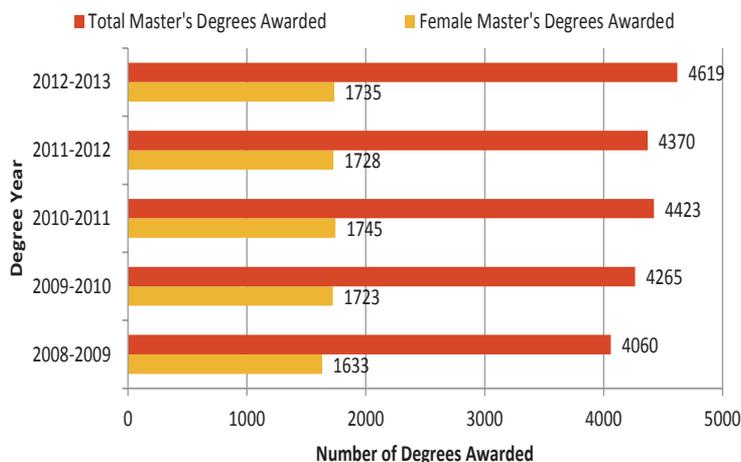


Total Master's Degrees Awarded: 6,395

*Degrees awarded between July 1, 2012 and June 30, 2013.

- Looking at all mathematics departments combined:
 - Masters departments awarded the highest percentage of degrees (27%, the same as last year).
 - Math Private Small awarded the fewest fraction of degrees with 3%, down from 4% last year.
 - Females received 38% of all degrees awarded among all the mathematics departments combined, down from 40% last year.
 - 17% of degrees awarded to females in all mathematics departments combined were in statistics-only or computer-science-only, compared to 13% for males.
- Statistics and Biostatistics departments combined:
 - awarded 1,775 degrees, an increase of 13% from last year; females received 51% of these degrees (up from 50% last year).
 - statistics-only degrees awarded by the Biostatistics Group increased 37% to 353 from 257 last year.

Figure MD.2: Master's Degrees Awarded All Mathematics Combined



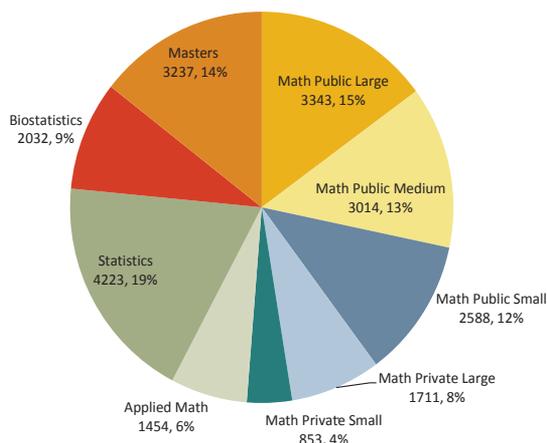
Comparing master's degrees awarded this year with those awarded in 2008-2009:

- Total degrees awarded have increased 14% overall.
- Total degrees awarded to females decreased from 40% to 38%.

Graduate Students

The total number of full-time graduate students in fall 2013 in all mathematics departments combined is 16,199, up from 15,658 in fall 2012. The total number of full-time graduate students in doctoral mathematics departments combined (Math Public, Math Private, and Applied Math) is 12,963 (up from 12,684). The number of US citizens among the doctoral mathematics departments combined decreased slightly to 6,872 and the number of US citizen first-year students remained essentially unchanged at 1,793 compared to 1,796 for fall 2012. For the Masters Group, full-time graduate students increased 9% to 3,237, the number of US citizens is 2,417 (up from 2,222), and the number of first-year students is 1,383 (up from 1,302). Statistics and Biostatistics combined reported full-time graduate students as 6,255, up from 5,749.

Figure GS.1: Graduate Students by Department Grouping



Total Graduate Students: 22,453

- Full-time graduate students increased in all groups except Math Public Medium and Math Public Small, which decreased slightly.
- Biostatistics departments had the largest percentage and number increase in graduate students with 19% (up 318 from 1,714 to 2,032).
- Females account for 36% (8,127) of the full-time graduate students; all groups reported increases except Math Private Small.
- First-year graduate students increased in all groups. The Biostatistics, Statistics, and Math Public Large groups had the largest percentage increases with 28%, 19%, and 15%, respectively.
- US citizen graduate students increased 5% overall; all groups reported increases except Math Public Medium, Math Private Large, and Math Private Small, which reported slight decreases.
- Total part-time graduate students decreased in all groups except Math Private Large, Applied Math, and Masters, which increased 5%, 35%, and 6%, respectively.

Table GS.2: Full-Time Graduate Students in All Doctoral Math Combined by Gender and Citizenship, Fall 2006–2013¹

	2006	2007	2008	2009	2010	2011	2012	2013
Total full-time graduate students	10984	10937	10883	11286	13048	12514	12684	12961
Female	3279	3249	3193	3248	3839	3773	3771	3969
% Female	30%	30%	29%	29%	29%	30%	30%	31%
% U.S. Citizen	56%	56%	55%	56%	57%	56%	54%	53%
% Underrepresented minorities ²	9%	9%	9%	9%	11%	8%	8%	9%
Total first-year full-time graduate students	2960	2964	2924	3040	3313	3288	3394	3623
Female	961	950	870	904	1019	1077	1036	1205
% Female	32%	32%	30%	30%	31%	33%	31%	33%
% U.S. Citizen	55%	56%	56%	55%	51%	50%	54%	53%
% Underrepresented minorities	10%	10%	10%	9%	9%	9%	7%	10%

¹ Figures adjusted since the original report are in red.

² Underrepresented minorities includes any person having origins within the categories American Indian or Alaska Native, Black or African American, Hispanic or Latino, and Native Hawaiian or Other Pacific Islander.

Looking at Table GS.2 we see that although the numbers and percentages have fluctuated somewhat among the categories, the numbers of full-time and first-year graduate students have increased this year, while the percentage of US citizens has dropped for the fourth consecutive year, and female first-year graduate students has increased. The number of full-time and full-time first-year graduate students have both reached an eight-year high, increasing 18% and 22% from their levels in 2006.

Faculty Categories

The faculty categories used in this report are described below. Departments were asked to report any faculty member who was considered to be full-time in the institution for the academic year and at least half-time in the department. Each faculty member was reported in exactly one of these categories.

Tenure-track faculty includes full-time faculty who hold tenured/tenure-eligible positions (i.e. those individuals who are tenured full-professors, other tenured and tenure-eligible faculty).

Postdoctoral faculty includes full-time faculty who have teaching and/or research responsibilities, but for a strictly limited term of employment (i.e. those individuals who hold a temporary position primarily intended to provide an opportunity to continue training or to further research experience).

Non-tenure-track faculty includes full-time faculty eligible for benefits and with an appointment that lasts at least one academic year (i.e. individuals with renewable*, fixed-term but not renewable or other full-time but temporary faculty appointments). *Include in this line those with appointments that are eligible for unlimited renewal. These include positions with titles such as Lecturer, Senior Lecturer, Instructor, Senior Instructor, Associate/Assistant/Full Teaching Professor, Professor of the Practice, or Clinical Professor, and similar titles for research-only faculty.

Part-time faculty includes those individuals who are hired term-by-term and are paid by the course and those in phased retirement.

Department Groupings

Starting with reports on the 2012 AMS-ASA-IMS-MAA-SIAM Annual Survey of the Mathematical Sciences, the Joint Data Committee has implemented a new method for grouping the doctorate-granting mathematics departments. These departments are first grouped into those at public institutions and those at private institutions. These groups are further subdivided based on the size of their doctoral program as reflected in the average annual number of PhD's awarded between 2000 and 2010, based on their reports to the Annual Survey during this period. Furthermore, doctorate-granting

departments which self-classify their PhD program as being in applied mathematics will join with the other applied mathematics departments previously in Group Va to form their own group. The former Group IV will be divided into two groups, one for departments in statistics and one for departments in biostatistics.

For further details on the change in the doctoral department groupings see the article in the October 2012 issue of *Notices of the AMS* at www.ams.org/notices/201209/rtx120901262p.pdf.

Math. Public Large consists of departments with the highest annual rate of production of PhD's, ranging between 7.0 and 24.2 per year.

Math. Public Medium consists of departments with an annual rate of production of PhD's, ranging between 3.9 and 6.9 per year.

Math. Public Small consists of departments with an annual rate of production of PhD's of 3.8 or less per year.

Math. Private Large consists of departments with an annual rate of production of PhD's, ranging between 3.9 and 19.8 per year.

Math. Private Small consists of departments with an annual rate of production of PhD's of 3.8 or less per year.

Applied Mathematics consists of doctoral-degree-granting applied mathematics departments.

Statistics consists of doctoral-degree-granting statistics departments.

Biostatistics consists of doctoral-degree-granting biostatistics departments.

Group Masters contains US departments granting a master's degree as the highest graduate degree.

Group Bachelors contains US departments granting a baccalaureate degree only.

Listings of the actual departments that compose these groups are available on the AMS website at www.ams.org/annual-survey/groups.

Remarks on Statistical Procedures

The questionnaire on which this report is based, "Departmental Profile", is sent to all doctoral and master's departments.

The response rates vary substantially across the different department groups. For most of the data collected on the Departmental Profile form, the year-to-year changes in a given department's data are very small when compared to the variations among the departments within a given group. As a result of this, the most recent prior year's response is used (imputed) if deemed suitable. After the inclusion of prior responses, standard adjustments for the remaining nonresponse are then made to arrive at the estimates reported for the entire groups.

Standard errors were calculated for some of the key estimates for all Doctoral Math Groups (Math Public, Math Private, and Applied Math) combined, for Groups Masters and Bachelors, and for Statistics and Biostatistics combined. Standard errors are calculated using the variability in the data and can be used to measure how

close our estimate is to the true value for the population. As an example, the number of full-time faculty in Group Masters is estimated at 4,516 with a standard error of 100. This means the actual number of full-time faculty in Group Masters is most likely between 4,516 plus or minus two standard errors, or between 4,316 and 4,716. This is much more informative than simply giving the estimate of 4,516.

Estimates are also given for parameters that are totals from all groups, such as the total number of full-time faculty. For example, an estimate of the total number of full-time faculty in all groups except Statistics and Biostatistics combined is 2,174, with a standard error of 92.

The careful reader will note that a row or column total may differ slightly from the sum of the individual entries. All table entries are the rounded values of the individual projections associated with each entry, and the differences are the result of this rounding (as the sum of rounded numbers is not always the same as the rounded sum).

Department Grouping Response Rates

Survey Response Rates by Grouping

**Departmental Profile
Department Response Rates**

Department Group	Number	Percent	Imputed ¹
Math Public Large	25 of 26	96%	2
Math Public Medium	40 of 40	100%	3
Math Public Small	61 of 64	95%	13
Math Private Large	24 of 24	100%	5
Math Private Small	27 of 28	97%	3
Applied Math	2 of 25 ²	92%	2
Statistics	55 of 59	93%	12
Biostatistics	32 of 34 ²	74%	9
Masters	136 of 182	75%	39
Bachelors	565 of 1,002	56%	135

¹ See paragraph two under 'Remarks on Statistical Procedures.'

² The populations for Applied Math and Biostatistics are slightly less than for the Doctorates Granted Survey because some programs do not formally "house" faculty, teach undergraduate courses, or award undergraduate degrees.

Acknowledgments

The Annual Survey attempts to provide an accurate appraisal and analysis of various aspects of the academic mathematical sciences scene for the use and benefit of the community and for filling the information needs of the professional organizations. Every year, college and university departments in the United States are invited to respond. The Annual Survey relies heavily on the conscientious efforts of the dedicated staff members of these departments for the quality of its information. On behalf of the Data Committee and the Annual Survey Staff, we thank the many secretarial and administrative staff members in the mathematical sciences departments for their cooperation and assistance in responding to the survey questionnaires.