

Fall 2012 Departmental Profile Report

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This report presents a profile of mathematical sciences departments at four-year colleges and universities in the United States, as of fall 2012. 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.

Data collected earlier from these departments on recruitment and hiring and faculty salaries were presented in the Report on 2011-2012 Academic Recruitment and Hiring (pages 586-591 of the May 2013 issue of *Notices of the AMS*) and the 2011-2012 Faculty Salaries Report (pages 426-432 of the April 2013 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*

All groups reported an increase in the number of faculty for fall 2012. The estimated number of full-time faculty in all departments is 24,346 with 22,219 of these in all mathematics departments combined (Math Public, Math Private, Applied Math, Masters & Bachelors), up 1% from 22,039 last year. Full-time faculty among the doctoral mathematics departments combined (Math Public, Math Private & Applied Math) increased slightly to 8,634 from 8,528 last year. In the mathematics departments combined we estimate the number of nondoctoral full-time faculty is 3,692, down 2% from last year's estimate of 3,750. With a standard error of 85 for our 2013 estimate, this difference may be explained by sampling error. The total part-time faculty in all mathematics departments combined is estimated to be 6,907 (with a standard error of 181), up 8% from 6,419 last year.

Figure F.1: All Full-time Faculty by Department Groupings

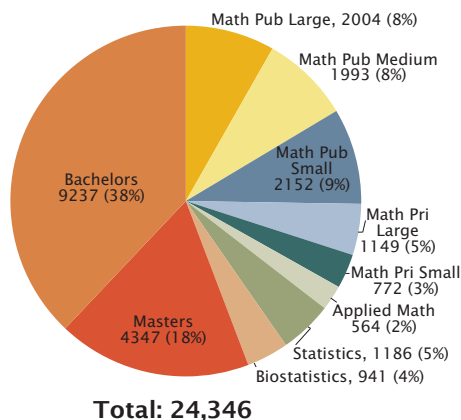


Figure F.2: Full-time Tenured Doctoral Faculty

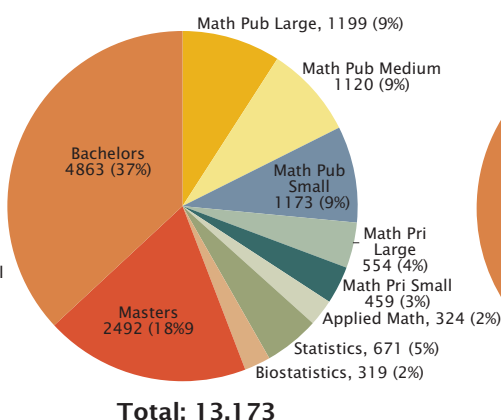
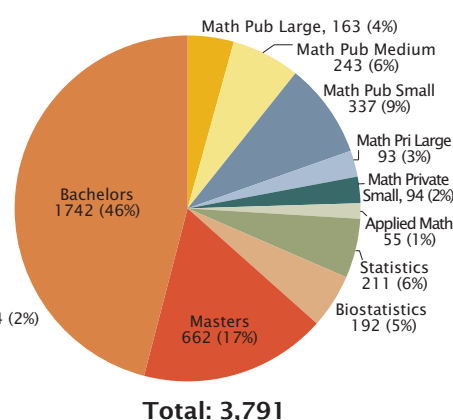


Figure F.3: Full-time Untenured, Tenure-track Doctoral Faculty

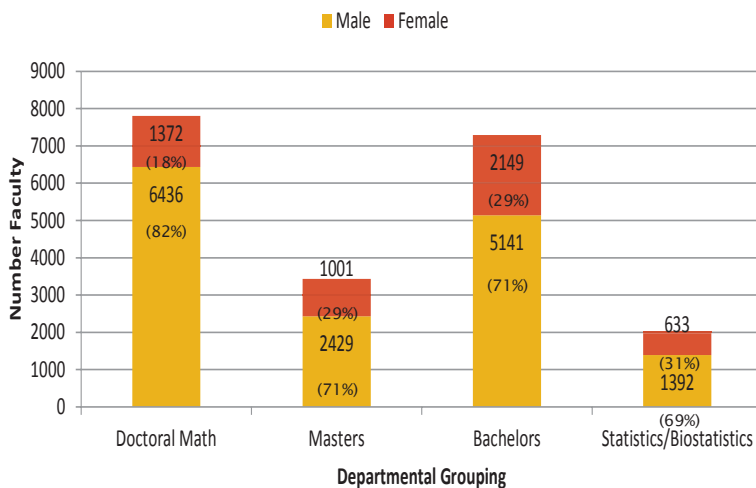


* All 2011 figures referenced on this page were adjusted to reflect the new departmental groupings introduced for 2012 (see page 166). Richard Cleary is a professor in the Division of Mathematics and Sciences at Babson College. James W. Maxwell is AMS associate executive director for special projects. Colleen A. Rose is AMS survey analyst.

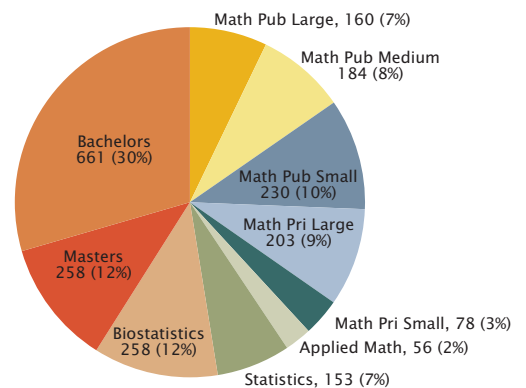
Doctoral Faculty*

The estimated number of full-time doctoral faculty in all mathematics departments combined (Math Public, Math Private, Applied Math, Masters & Bachelors) is 18,527 (with a standard error of 174), up slightly from last year's number of 18,289. For these same groups combined, total doctoral tenured faculty remained essentially unchanged at 12,183 compared to 12,196 for fall 2011. 35% (4,863) of all doctoral tenured faculty are in Bachelors departments.

**Figure D.1: Gender of Full-time Doctoral Faculty
Total: 20,551**



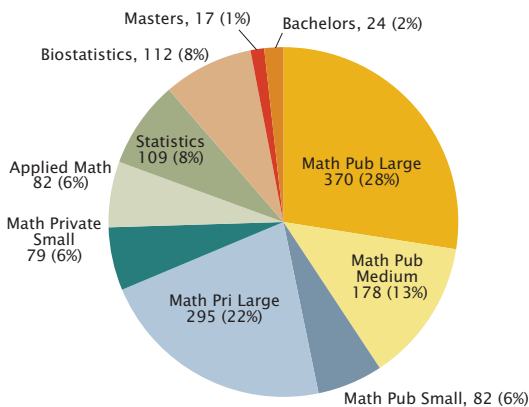
**Figure D.2: Non-tenure-track Doctoral Faculty (excluding Postdocs)
Total: 2,241**



Total: 2,241

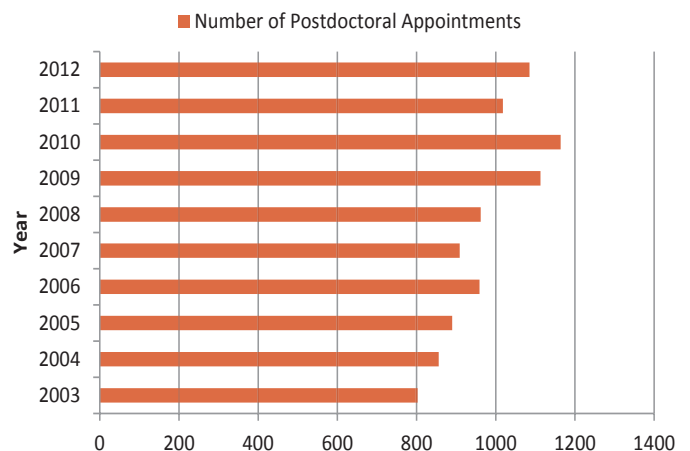
Postdoctoral appointments among the doctoral mathematics departments increased to 1,085 for fall 2012. This is a 6% increase from last year and 14% of the total full-time doctoral faculty in these departments. Females hold 19% of all postdoctoral appointments. Since 2003 total postdoctoral appointments among these departments has increased 35% and females holding postdocs increased 45% to 207 from 143.

Figure D.3: Full-time Postdoctoral Faculty



Total: 1,347

Figure D.4: Postdoctoral Faculty in All Doctoral Mathematics Departments Combined by Year, Fall 2003 to Fall 2012



* All 2011 figures referenced on this page were adjusted to reflect the new departmental groupings introduced for 2012 (see page 166).

Nondoctoral Faculty*

The estimated number of nondoctoral full-time faculty in all mathematics departments combined (Math Public, Math Private, Applied Math, Masters & Bachelors) is 3,692. This is down 2% from last year and is 17% of all full-time faculty (22,219) in these departments. In addition, nondoctoral tenured faculty decreased 15% from 748 to 633 this year. 195 of the nondoctoral faculty in all mathematics departments are untenured, tenure-track faculty, 4% of all untenured tenure-track faculty in these groups. Nondoctoral full-time non-tenure-track faculty increased to 2,848; this is 77% of all nondoctoral mathematics faculty.

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

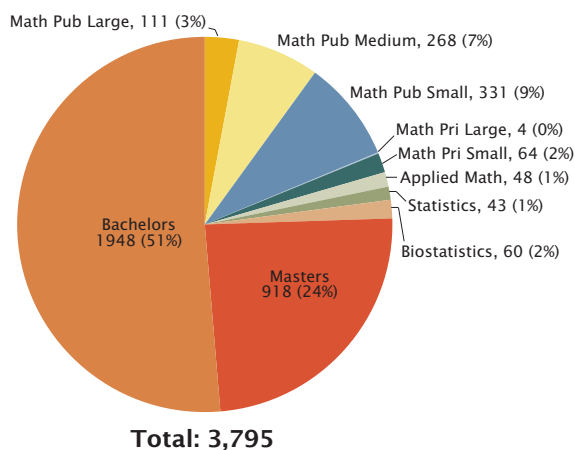


Figure ND.2: Full-time Nondoctoral Tenured Faculty

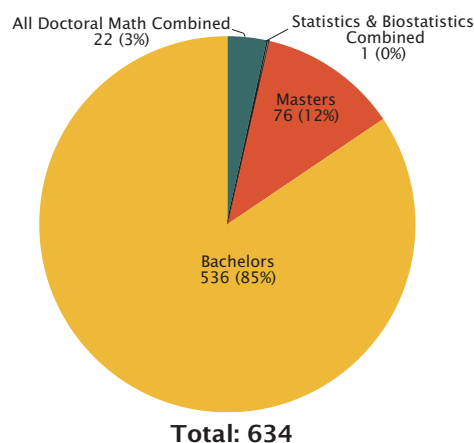
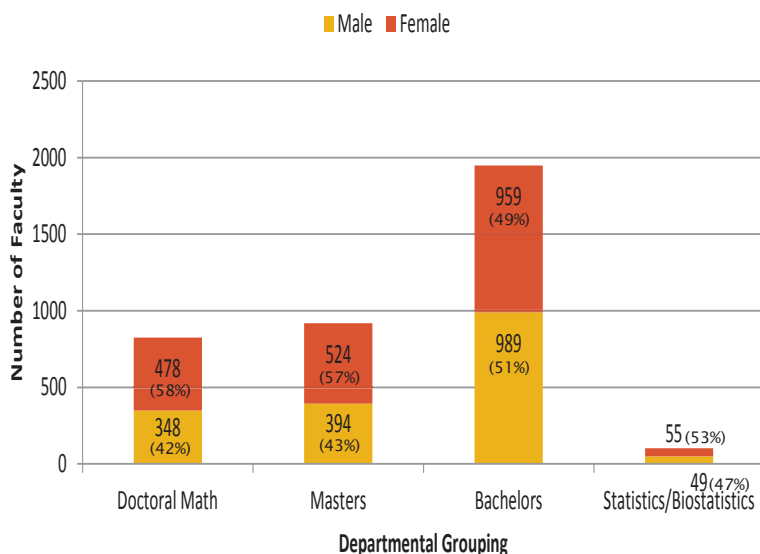


Figure ND.3: Gender of Full-time Nondoctoral Faculty
Total: 3,795



- Females account for 53% of full-time nondoctoral faculty in all mathematics groups combined (down from 54% last year), compared to females accounting for 24% of all doctoral full-time faculty and 29% of all full-time faculty.
- Total part-time nondoctoral faculty in all doctoral mathematics departments combined (Math Public, Math Private and Applied Math) is 694, 59% of all part-time faculty in these groups.

* All 2011 figures referenced on this page were adjusted to reflect the new departmental groupings introduced for 2012 (see page 166).

Female Faculty*

For the combined mathematics departments (Math Public, Math Private, Applied Math, Masters and Bachelors), women comprised 29% (6,482 with a standard error of 83) of the full-time faculty (22,219) in fall 2012. For the doctoral mathematics departments combined (Math Public, Math Private and Applied Math), women comprised 14% of the combined doctoral-holding tenured and tenure-track faculty and 27% of the doctoral-holding non-tenure-track (including postdocs) faculty in fall 2012. For Masters faculty these same percentages are 28 and 39, and for Bachelors faculty they are 29 and 33, respectively. Among the nondoctoral full-time faculty in all math departments combined, women comprise 53%. Females account for 41% of all part-time faculty in mathematics departments combined.

Figure FF.1: Tenured Female Doctoral Faculty

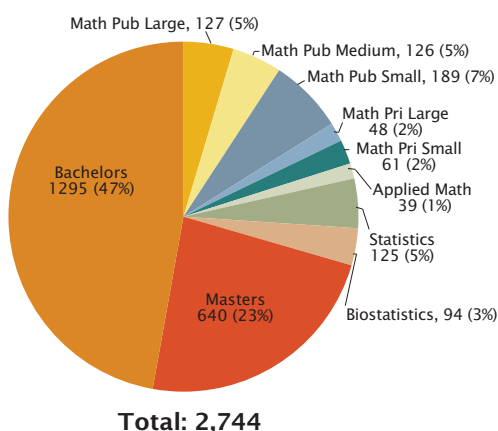


Figure FF.2: Untenured, Tenure-track Female Doctoral Faculty

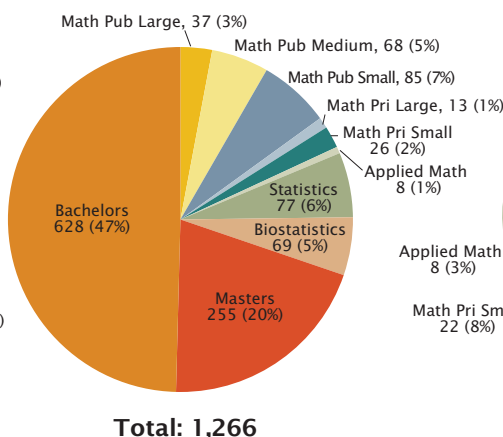


Figure FF.3: Postdoctoral Female Faculty

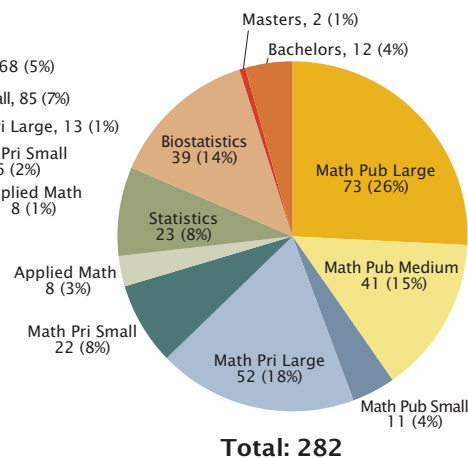
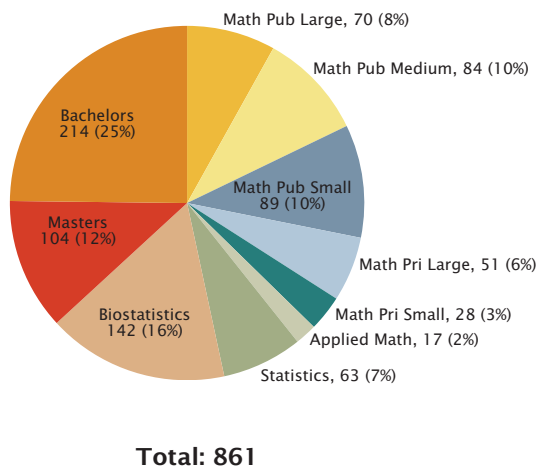


Figure FF.4: Female Doctoral Non-tenure-track Faculty (excluding Postdocs)



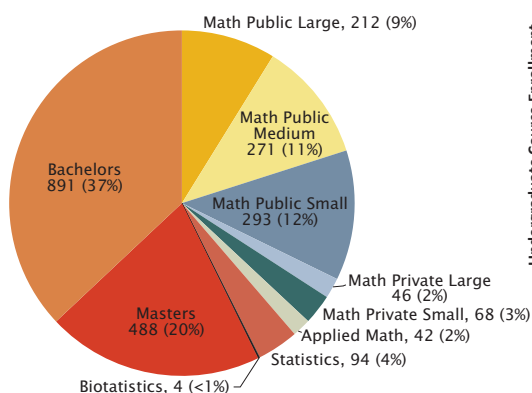
- Females hold 12% of full-time tenured and 24% of full-time untenured/tenure-track positions in all doctoral mathematics departments combined.
- 43% of all full-time female faculty (in all groups combined) are in the Bachelors Group.
- Masters departments reported the highest percentage of full-time female faculty (35%), while Math Private Large reported the lowest (14%).
- Females hold 21% of all postdoctoral appointments. 35% 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.
- 53% of all part-time female faculty among the mathematics departments combined are found in the Bachelors Group.

* All 2011 figures referenced on this page were adjusted to reflect the new departmental groupings introduced for 2012 (see page 166).

Undergraduate Course Enrollments

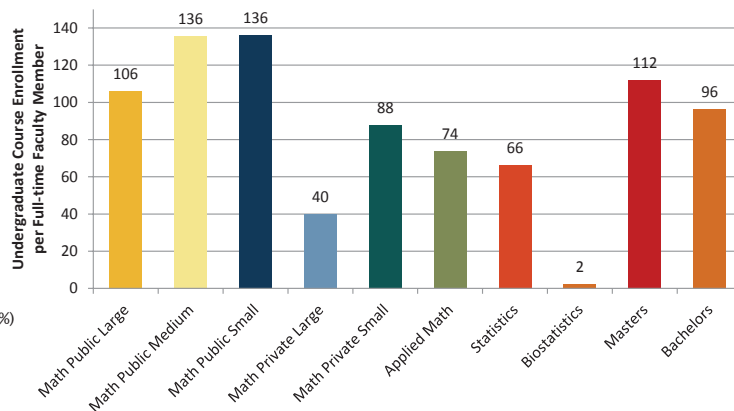
Total undergraduate enrollments for all groups combined increased by 2% (57,000) to 2,407,000 (with a standard error of 23,000). All departments combined reported an overall increase of 14% in the number of undergraduate course enrollments per full-time faculty member.

Figure UE.1: Undergraduate Course Enrollments by Department Groupings (Thousands)



Total Undergraduate Enrollments (thousands): 2,407

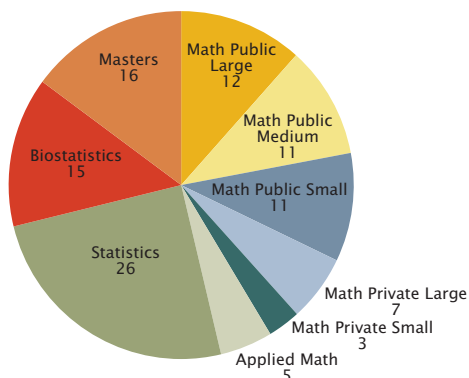
Figure UE.2: Undergraduate Course Enrollment per Full-Time Faculty Members, Fall 2012



Graduate Course Enrollments

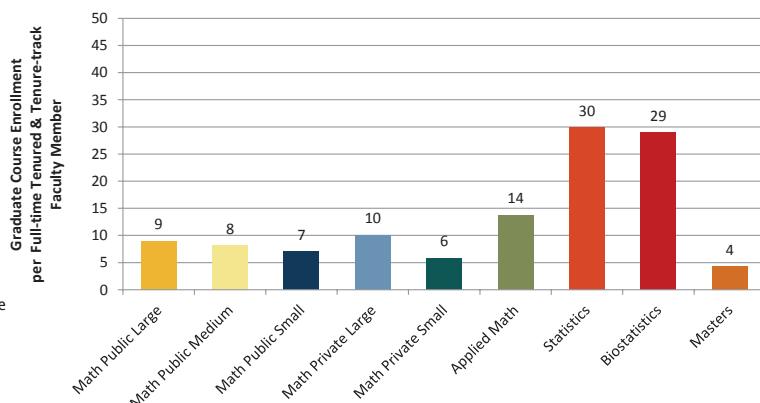
Total graduate course enrollments have increased by 3% (3,000) to 106,000 (with a standard error of 3,000). All departments combined reported an overall increase of 8% in the estimated number of graduate course enrollments per full-time tenured/tenure-track faculty member.

Figure GE.1: Graduate Course Enrollments by Department Groupings (Thousands)



Total Graduate Enrollments (thousands): 106

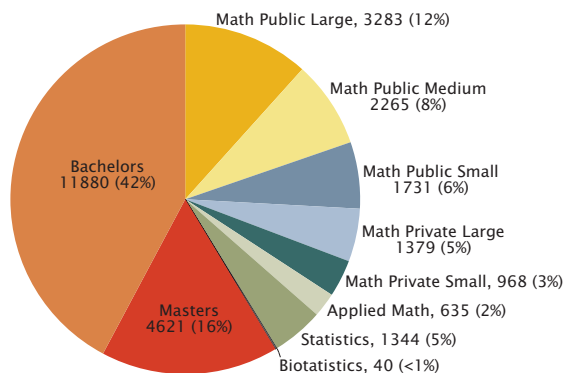
Figure GE.2: Graduate Course Enrollment per Full-Time Tenured and Tenure-track Faculty Member, Fall 2012



Undergraduate Degrees Awarded

The estimated number of undergraduate degrees awarded during 2011-2012 by all mathematics departments combined (Math Public, Math Private, Applied Math, Masters, and Bachelors) is 26,761 (with a standard error of 442), up 7% from last year's estimate of 25,054. The growth in degrees was similar for males and females. Females earned 41% (10,980) of undergraduate degrees, almost exactly the same as last year. This year's estimated number of undergraduate degrees awarded included 477 statistics-only and 1,987 computer-science only.

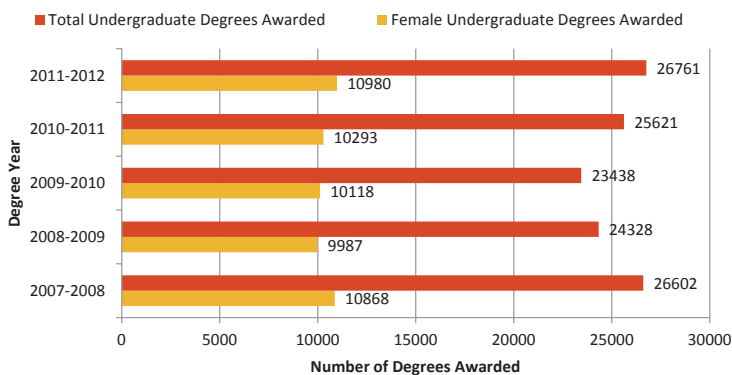
Figure UD.1: Undergraduate Degrees Awarded by Department Groupings



Total Degrees Awarded: 28,145

- Math Doctoral departments awarded 18% more degrees this year, up 1,539 from last year; 32% of all degrees awarded.
- Bachelors departments awarded 42% of all the degrees, down from 48% last year in all mathematics departments combined.
- Total statistics-only degrees increased in all mathematics departments combined by 30% to 477.
- Statistics and Biostatistics departments combined reported a 61% increase in degrees awarded, but most of the increase comes from one department that has reported tremendous growth over the past year.

Figure UD.2: Undergraduate Degrees Awarded All Mathematics Combined



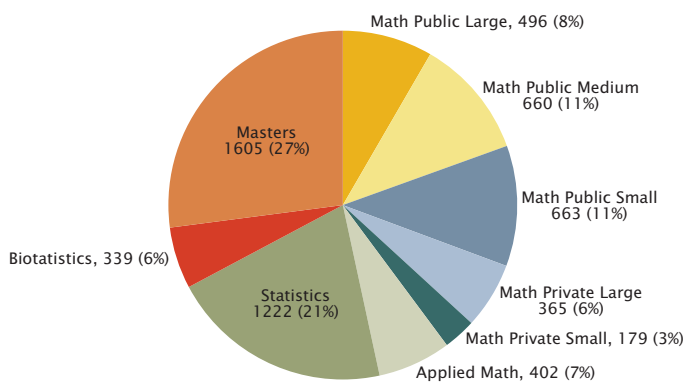
Comparing undergraduate degrees awarded this year with those awarded in 2007-2008:

- Degrees awarded have increased slightly.
- Degrees awarded to females increased by 1%.
- The percentage of total degrees awarded to females is the same, 41%.

Master's Degrees Awarded

The estimated number of master's degrees awarded during 2011-2012 in all mathematics departments combined (Math Public, Math Private, Applied Math, and Masters is 4,370, a 1% increase from last year's estimate of 4,030 (with a standard error of 131). This year's estimated graduate degrees included 1,888 statistics-only and 125 computer science-only degrees. Departments reported a slight decrease in the number of degrees awarded to females, 1,728.

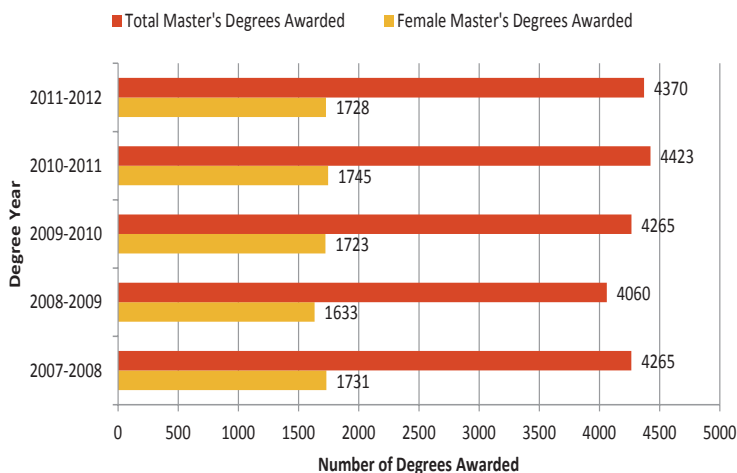
Figure MD.1: Master's Degrees Awarded by Department Groupings



Total Degrees Awarded: 5,931

- Looking at all mathematics departments combined:
 - Masters departments awarded the highest percentage of degrees (37%, down from 40% last year).
 - Math Private Small awarded the fewest degrees with 4%.
 - Females received 40% of all degrees awarded among all the mathematics departments combined; the same as last year.
 - 16% of degrees awarded to females in all mathematics departments combined were in statistics-only or computer science-only, compared to 12% for males.
- Statistics and Biotstatistics combined awarded 1,561 degrees, an increase of 14% from last year; females received 50% of these degrees (up from 47% last year).

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



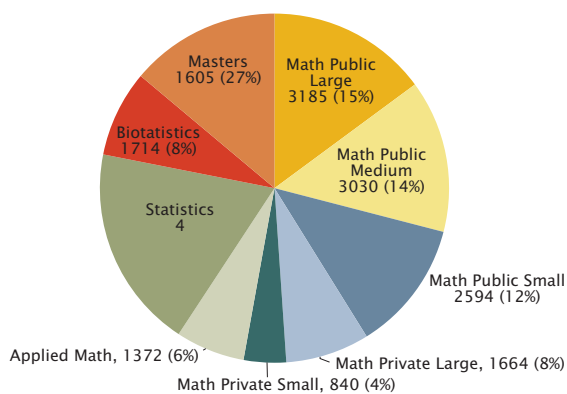
Comparing master's degrees awarded this year with those awarded in 2007-2008:

- Total degrees awarded have increased 2% overall.
- Total degrees awarded to females decreased from 41% to 40%.

Graduate Students*

The total number of full-time graduate students in all mathematics departments combined is 15,658, up from 15,122 in fall 2012. The total number of full-time graduate students in doctoral mathematics departments combined (Math Public, Math Private and Applied Math) is 12,684 (up from 12,464). The number of U.S. citizens among the doctoral mathematics departments combined dropped slightly to 6,893 and the number of U.S. citizen first-year students decreased 2% to 1,796. For Group Masters, full-time graduate students increased 8% to 2,974, the number of U.S. citizens is 2,222 (up from 2,180), and the number of first-year students is 1,302 (up from 1,244). Statistics and Biostatistics combined reported full-time graduate students as 5,749, up from 5,316.

Figure GS.1: Graduate Students by Department Groupings



Total Graduate Students: 21,407

- Full-time graduate students increased in all groups except Math Public Medium and Applied Math which decreased 2% and 3%, respectively.
- Biostatistics departments had the largest percentage increase in graduate students with 13% (up 199 from 1,515 to 1,714), while Masters departments had the largest number increase—up 326 from 2,648 to 2974.
- Females account for 36% (7,707) of the full-time graduate students; all groups reported increases except Math Public Medium, Math Private Large and Applied Math.
- First-year graduate students in Math Public Medium, Math Private Large and Biostatistics decreased by 6%, 4% and 41% respectively. All groups increased with Applied Math and Statistics increasing by 33% and 45%, respectively.
- U.S. citizen graduate students decreased slightly overall; all doctoral mathematics departments, except Math Public Small (which increased 10%) reported decreases.
- Total part-time graduate students increased slightly in all groups with Math Public Small and Masters having the largest increases at 4% and 8%, respectively.

Table GS.2: Full-Time Graduate Students in All Doctoral Math Combined by Gender and Citizenship, Fall 2006–2012

	2006	2007	2008	2009	2010	2011	2012
Total full-time graduate students	10984	10937	10883	11286	13048	12464	12684
Female	3279	3249	3193	3248	3839	3745	3771
% Female	30%	30%	29%	29%	29%	30%	30%
% U.S. Citizen	56%	56%	55%	56%	57%	56%	54%
% Underrepresented minorities ¹	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%
Total first-year graduate students	2960	2964	2924	3040	3313	3200	3394
Female	961	950	870	904	1019	1078	1036
% Female	32%	32%	30%	30%	31%	33%	31%
% U.S. Citizen	55%	56%	56%	55%	51%	50%	54%
% Underrepresented minorities	10.0%	10.0%	10.0%	10.0%	9.0%	9.0%	9.0%

¹ 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 U.S. citizens and female first-year graduate students has dropped. While the number of full-time and full-time first-year graduate students have both increased 15% above their level in 2006, they have dropped 3% and 2% from their seven year highs in 2010.

* All 2011 figures referenced on this page were adjusted to reflect the new 2012 groupings for comparison.

Remarks on Statistical Procedures

The questionnaire on which this report is based, "Departmental Profile", is sent to all doctoral and master's departments. It is sent to a stratified random sample of bachelors departments, the stratifying variable being the undergraduate enrollment at the institution.

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 4,347 with a standard error of 68. This means the actual number of full-time faculty in Group Masters is most likely between 4,347 plus or minus two standard errors, or between 4,211 and 4,484. This is much more informative than simply giving the estimate of 4,347.

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 but Statistics and Biostatistics combined is 22,219, with a standard error of 190.

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).

Departmental 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 Ph.D.'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 Ph.D. 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 <http://www.ams.org/notices/201209/rtx120901262p.pdf>.

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

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

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

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

Math. Private Small consists of departments with an annual rate of production of Ph.D.'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 U.S. departments granting a master's degree as the highest graduate degree.

Group Bachelors contains U.S. departments granting a baccalaureate degree only.

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

Departmental Response Rates

Survey Response Rates by New Groupings

Departmental Profile
Department Response Rates

Department Group	Number	Percent	Imputed ¹
Math Public Large	22 of 26	85%	3
Math Public Medium	31 of 40	78%	9
Math Public Small	50 of 64	78%	12
Math Private Large	29 of 24	96%	1
Math Private Small	24 of 28	86%	2
Applied Math	20 of 25 ²	80%	3
Statistics	42 of 59	71%	14
Biostatistics	17 of 35	46%	12
Masters	92 of 180	51%	40
Bachelors	273 of 591 ³	46%	83

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

² The population for Applied Math is slightly less than for the Doctorates Granted Survey because four programs do not formally "house" faculty, teach undergraduate courses, or award undergraduate degrees.

³ This is the sampled population, the total population for Bachelors is 1,007.

About the Annual Survey

The Annual Survey series, begun in 1957 by the American Mathematical Society, is currently under the direction of the Data Committee, a joint committee of the American Mathematical Society, the American Statistical Association, the Mathematical Association of America, and the Society of Industrial and Applied Mathematics. The current members of this committee are Richard Cleary (chair), Charles Epstein, Amanda Gabeck, Sue Geller, Boris Hasselblatt, Loek Helminck, Ellen Kirkman, Peter March, David R. Morrison, James W. Maxwell (ex officio), William Velez, and Edward Waymire. The committee is assisted by AMS survey analyst Colleen A. Rose. In addition, the Annual Survey is sponsored by the Institute of Mathematical Statistics. Comments or suggestions regarding this Survey Report may be emailed to the committee at ams-survey@ams.org.

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.

Other Sources of Data

Visit the AMS website at www.ams.org/annual-survey/other-sources for a listing of additional sources of data on the Mathematical Sciences.