

# Fall 2011 Departmental Profile Report

*Richard Cleary, James W. Maxwell, and Colleen Rose*

This report presents a profile of mathematical sciences departments at four-year colleges and universities in the United States, as of fall 2011. 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.

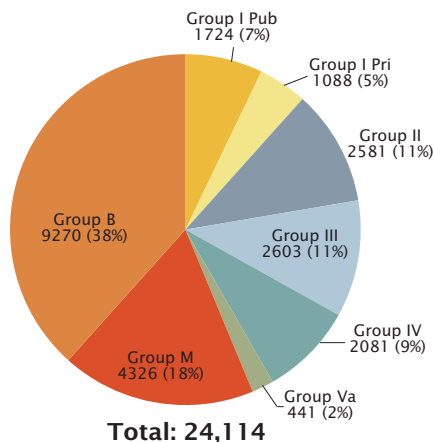
Data collected earlier from these departments on recruitment and hiring and faculty salaries were presented in the Report on 2010-2011 Academic Recruitment and Hiring (pages 796-800 of the June/July 2012 issue of *Notices of the AMS*) and the 2011-2012 Faculty Salaries Report (pages 410-415 of the March 2012 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](http://www.ams.org/annual-survey/survey-reports).

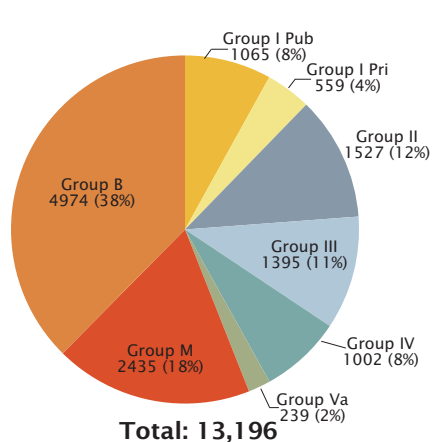
## Faculty Size

Changes in the numbers of faculty from 2010 to 2011 were modest except for a decrease in faculty in Group B. The estimated number of full-time faculty in all departments is 24,114 with 22,033 of these in all mathematics departments combined (Groups I, II, III, Va, M, and B), down 4% from 23,023 last year. The majority of this decrease is the result of the 12% decrease in estimated full-time faculty in Group B, down 1,240 to 9,270 (with a standard error of 202.) Full-time faculty among the doctoral mathematics departments combined (Groups I-III & Va) increased 2% to 8,437 from 8,297 last year. In the mathematics departments combined the number of nondoctoral full-time faculty is 3,743 (with a standard error of 99), down 2% from 3,817 last year. The total part-time faculty in all mathematics departments combined is estimated to be 5,955 (with a standard error of 164), down 2% from 6,067 last year.

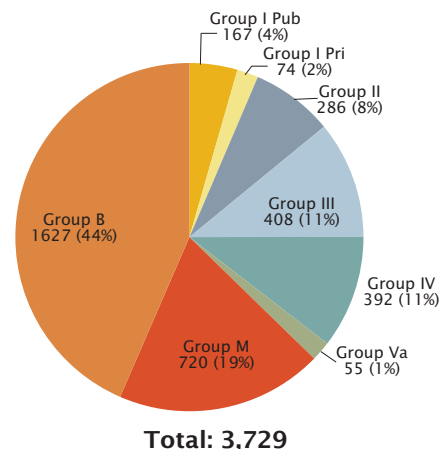
**Figure F.1: All Full-time Faculty by Department Groupings**



**Figure F.2: Full-time Tenured Doctoral Faculty**



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

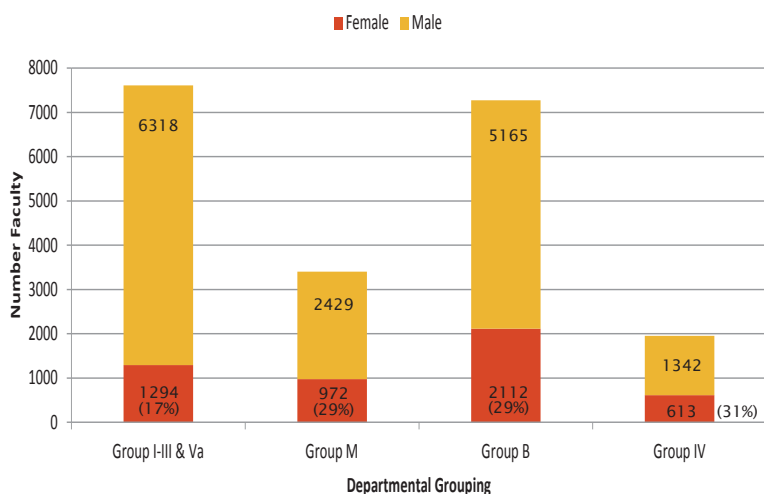


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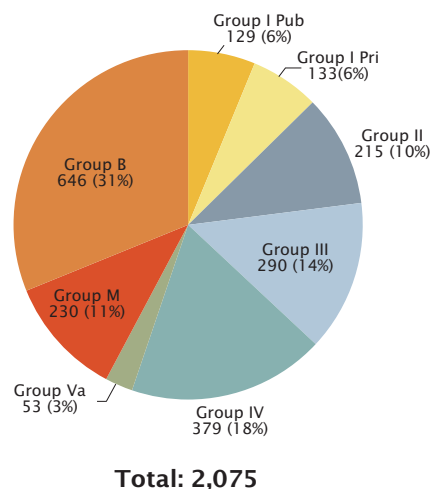
## Doctoral Faculty

The estimated number of full-time doctoral faculty in all mathematics departments combined (Groups I-III, Va, M and B) is 18,289 (with a standard error of 197), down 5% from last year's number of 19,206. For these same groups combined, total doctoral tenured faculty decreased 7% to 12,194. Essentially all of the decrease is due to a reported decrease of just over 1,000 for Group B; the standard error of this estimate is 188.

**Figure D.1: Gender of Full-time Doctoral Faculty**  
Total: 20,244

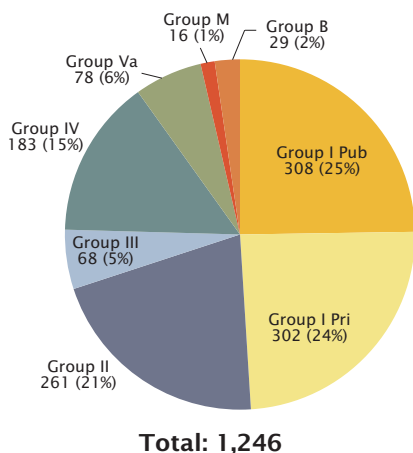


**Figure D.2: Non-tenure-track Doctoral Faculty (excluding Postdocs)**

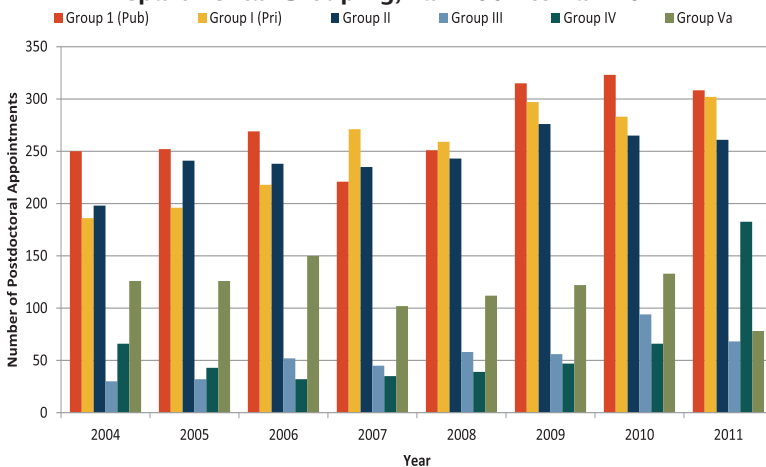


Postdoctoral appointments among the doctoral mathematics departments dropped to 1,018 for fall 2011. This is a 1% decrease from last year and 13% of the total full-time doctoral faculty in these departments. Females hold 22% of all postdoctoral appointments. Since 2004 total postdoctoral appointments have increased 40% and females holding postdocs increased 39% to 258 from 229. Postdoctoral appointments as a percentage of total full-time doctoral faculty, which held steady at 11% from 2005 to 2007 then increased slightly each year from 2008 to 2010 when it reached a high of 14%, has dropped to 13% this year.

**Figure D.3: Full-time Postdoctoral Faculty**



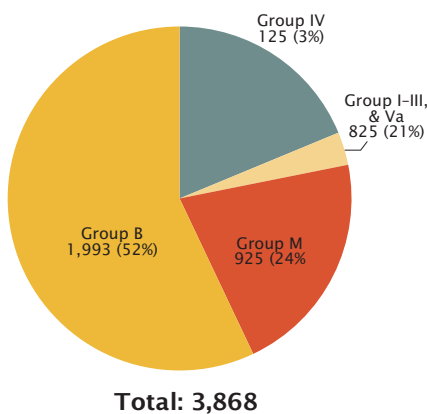
**Figure D.4: Postdoctoral Faculty, by Year and Departmental Grouping, Fall 2004 to Fall 2011**



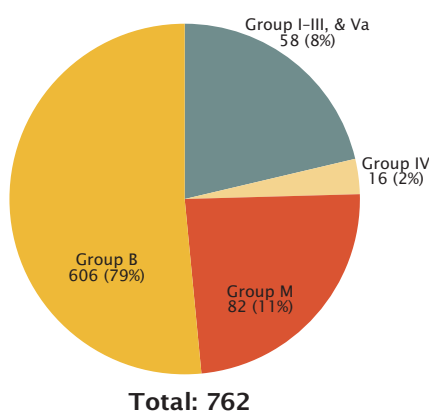
## Nondoctoral Faculty

The estimated number of nondoctoral full-time faculty in all mathematics departments combined (Groups I-III, Va, M and B) is 3,743. This is down 2% from last year and is 17% of all full-time faculty. 204 of the nondoctoral faculty in all mathematics departments are untenured, tenure-track faculty, 6% of all untenured tenure-track faculty in these groups. Nondoctoral full-time non-tenure-track faculty (including postdocs) decreased to 2,793; this is 75% of all nondoctoral mathematics faculty. There are 213 full-time nondoctoral untenured, tenure-track faculty some of whom are likely still in the process of completing their Ph.D.

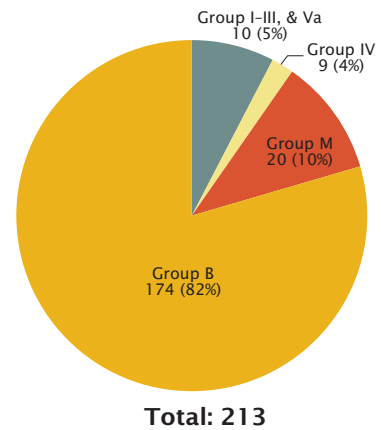
**Figure ND.1: Full-time Nondoctoral Faculty by Departmental Grouping**



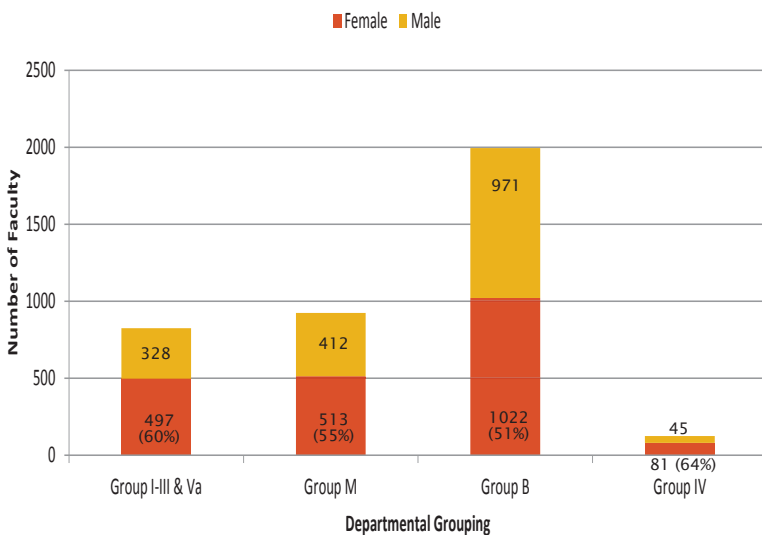
**Figure ND.2: Full-time Nondoctoral Tenured Faculty**



**Figure ND.3: Full-time Nondoctoral Untenured, Tenure-track Faculty**



**Figure ND.4: Gender of Full-time Nondoctoral Faculty**  
Total: 3,868

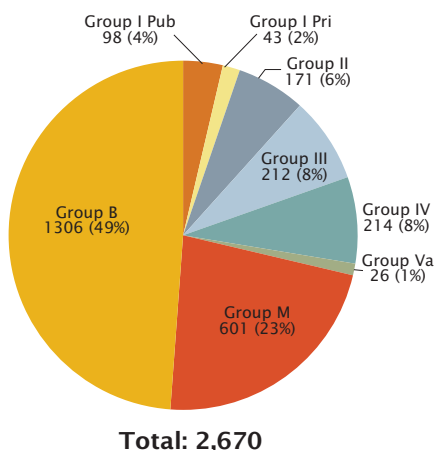


- Females account for 54% of full-time nondoctoral faculty in all mathematics groups combined (the same as last year), compared to females accounting for 29% of all full-time faculty.
- Total part-time nondoctoral faculty in all doctoral mathematics departments combined (Groups I-III, and Va) is 700, 64% of all part-time faculty in these groups.

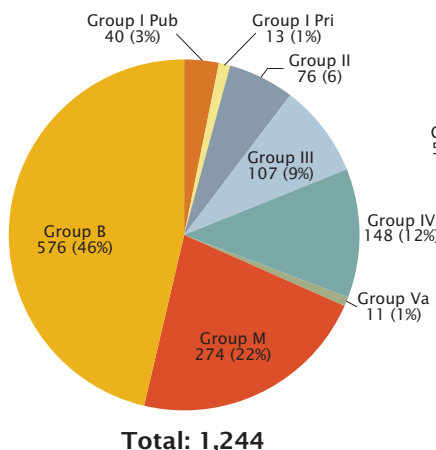
## Female Faculty

For the combined mathematics departments (Groups I-III, Va, M and B), women comprised 29% (6,409 with a standard error of 91) of the full-time faculty (22,033) in fall 2011. For the doctoral mathematics departments combined (Groups I-III, and Va), 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 2011. For Group M faculty these same percentages are 28 and 39, and for Group B faculty they are 29 and 34, respectively. Among the nondoctoral full-time faculty in all math departments combined, women comprise 54%. Females account for 41% of all part-time faculty in mathematics departments combined.

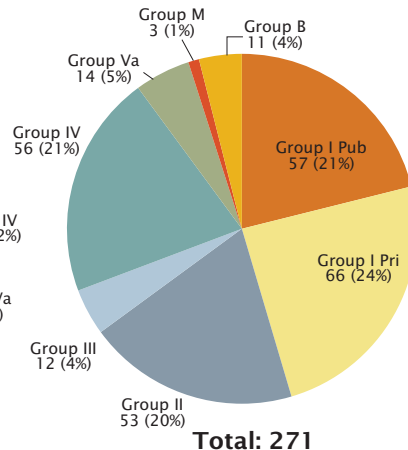
**Figure FF.1: Tenured Female Doctoral Faculty**



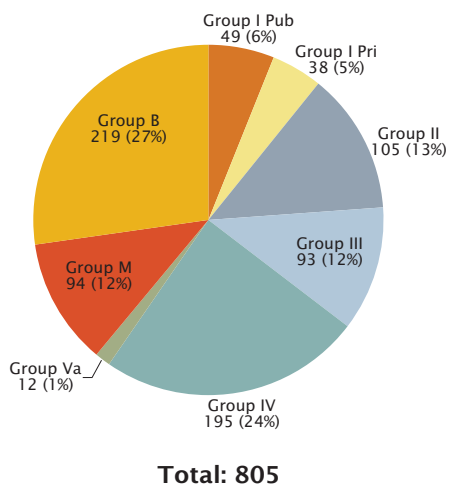
**Figure FF.2: Untenured, Tenure-track Female Doctoral Faculty**



**Figure FF.3: Postdoctoral Female Faculty**



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

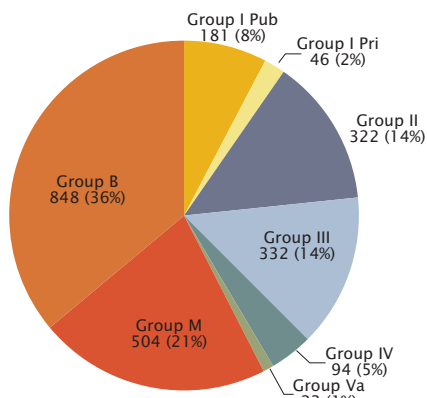


- 44% of all female faculty reported are in Group B. This group also reported the highest percentage of full-time female faculty (34%), while Group Va reported the lowest (15%).
- Females hold 22% of all postdoctoral appointments; the number of female postdocs increased slightly in Groups I (Pri), IV, Va, and B. 33% of all female postdocs in doctoral mathematics departments combined are found in Group I (Pri). This group reported the highest percentage (22%) of female postdocs.
- 53% of all part-time female faculty among the mathematics departments combined are found in Group B.

## Undergraduate Course Enrollments

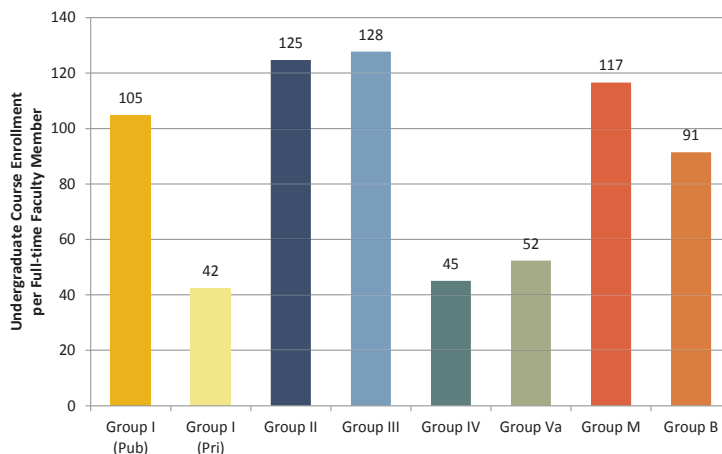
Total undergraduate enrollments for all groups combined decreased by 3% (68,000) to 2,350,000 (with a standard error of 23,000); most of this decrease came from Group B which decreased 14% (138,000) to 848,000 (with a standard error of 20,000). With fall 2011 we see a slight increase in the number of undergraduate course enrollments per full-time faculty member in all groups except Groups IV and Va.

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



**Total Undergraduate Enrollments (thousands): 2,350**

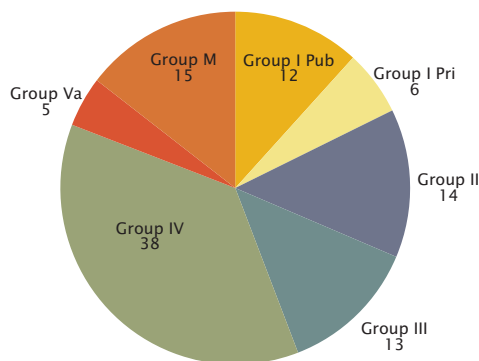
**Figure UE.2: Undergraduate Course Enrollment per Full-Time Faculty Members, Fall 2011**



## Graduate Course Enrollments

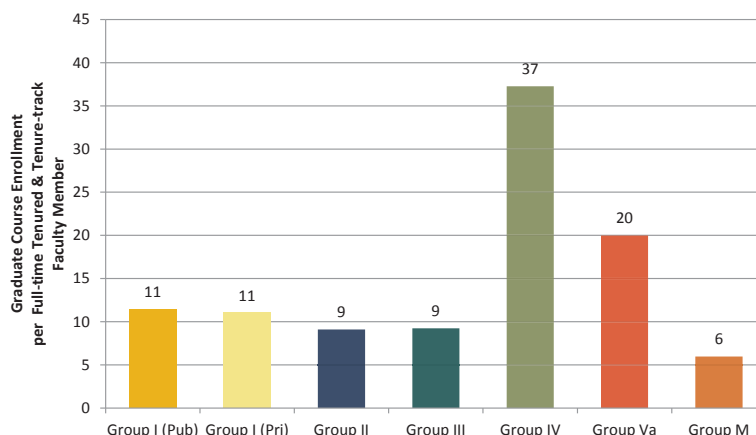
Total graduate course enrollments have increased by 7% (6,000) to 103,000 (with a standard error of 2,000). However, increases in the number of graduate course enrollments per full-time tenured/tenure-track faculty member occurred in all groups except Groups I (Pub) and M which remained flat.

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



**Total Graduate Enrollments (thousands): 103**

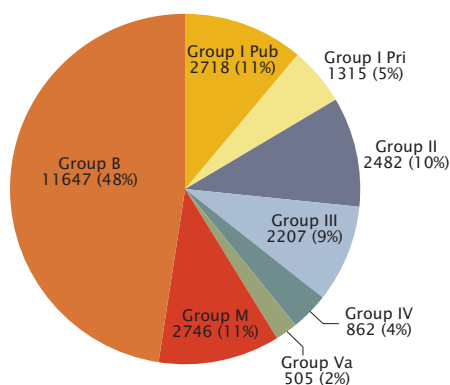
**Figure GE.2: Graduate Course Enrollment per Full-Time Tenured and Tenure-track Faculty Member, Fall 2011**



## Undergraduate Degrees Awarded

The estimated number of undergraduate degrees awarded during 2010-2011 by all mathematics departments combined (Groups I-III, Va, M and B) is 23,621 (with a standard error of 503), up 1% from last year's estimate of 23,438. Females accounted for 44% (10,293) of these degrees, a 2% increase over last year. This year's estimated number of undergraduate degrees awarded included 367 statistics-only and 1,835 computer-science only.

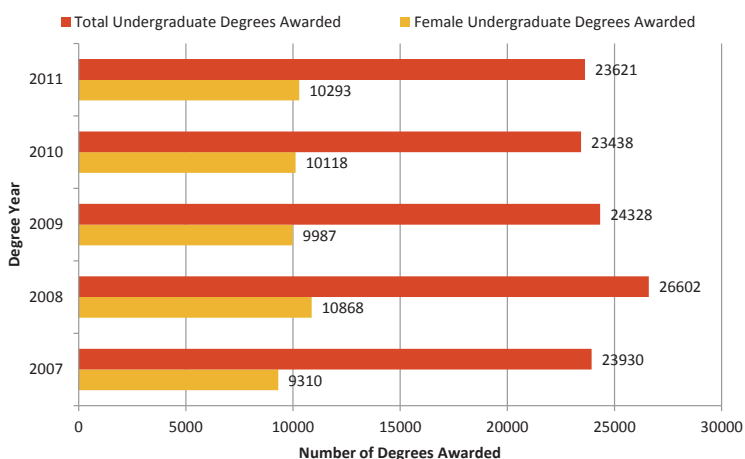
**Figure UD.1: Undergraduate Degrees Awarded by Department Groupings**



**Total Degrees Awarded: 24,483**

- All groups reported an increase in the number of degrees awarded except for Group M, Group B reported the largest increase, up 707 from last year.
- Group B awarded 49% of all the degrees, up from 47% last year in all mathematics departments combined.
- Group IV reported a 13% increase in degrees awarded.
- Total statistics-only degrees dropped in all mathematics departments combined by 25% to 367.
- Males were more likely to receive combined statistics-only or computer science-only degrees. About 14% of males earned such degrees compared to just 7% of females.

**Figure UD.2: Undergraduate Degrees Awarded Groups I, II, III, Va, M & B Combined**



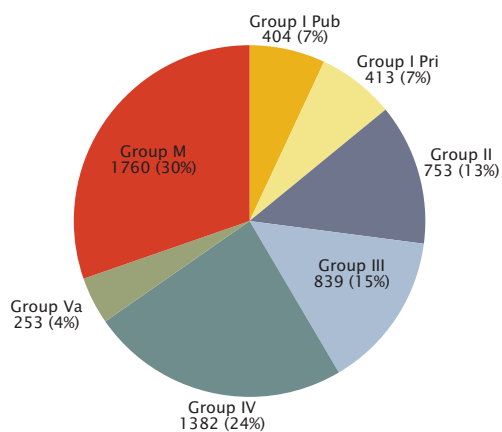
Comparing undergraduate degrees awarded this year with those awarded in 2007:

- Degrees awarded have decreased 1% overall.
- Degrees awarded to females increased by 11%.
- The percentage of total degrees awarded to females increased from 39% to 44%.

## Master's Degrees Awarded

The estimated number of master's degrees awarded during 2010-2011 in all mathematics departments combined (Groups I-III, Va, and M) is 4,423, a 4% increase from last year's estimate of 4,265. This year's estimated graduate degrees included 478 statistics-only and 250 computer science-only degrees. Departments reported a slight increase in the number of degrees awarded to females, 1,745.

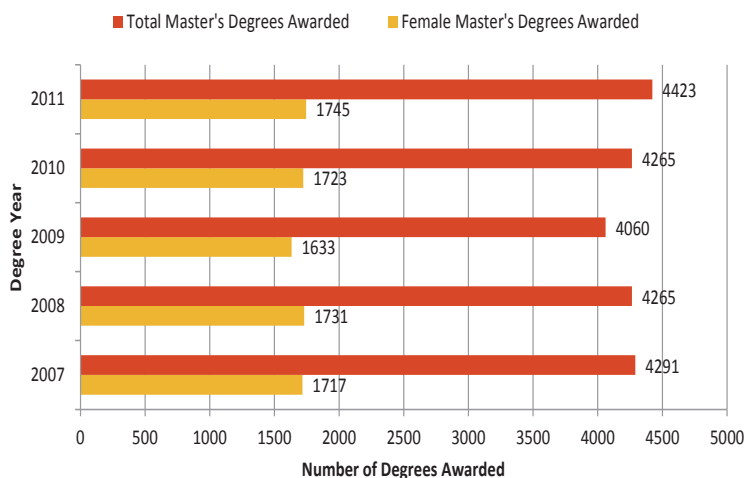
**Figure MD.1: Master's Degrees Awarded by Department Groupings**



**Total Degrees Awarded: 5,805**

- Looking at all mathematics departments:
  - Group M awarded the highest percentage of degrees (40%, down from 41% last year).
  - Group Va awarded the fewest degrees (6%, up from 5% last year). This group reported the largest percentage increase in degrees awarded; up 21% to 253 from 209 reported last year.
  - Females received 39% of all degrees awarded among all the mathematics departments combined; down from 40% last year.
  - Group III awarded the largest percentage of degrees to females (45%), while Group I (Pri) awarded the smallest percentage (24%).
  - 17% of degrees awarded to females in all mathematics departments combined were in statistics-only or computer science-only, compared to 16% for males.
- Group IV awarded 1,382 degrees, an increase of 10% from last year; females received 47% of these degrees.

**Figure MD.2: Master's Degrees Awarded Groups I, II, III, Va, M & B Combined**



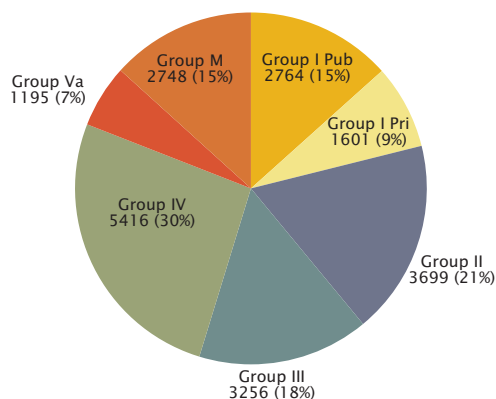
Comparing master's degrees awarded this year with those awarded in 2007:

- Total degrees awarded have increased 3% overall.
- Total degrees awarded to females dropped from 40% to 39%.

## Graduate Students

The total number of full-time graduate students in all mathematics departments combined is 15,262, down from 16,138 in fall 2010. The total number of full-time graduate students in doctoral mathematics departments combined (Groups I-III, & Va) is 12,514 (down from 13,048). The number of U.S. citizens among the doctoral mathematics departments combined decreased 7% to 6,951 and the number of U. S. citizen first-year students decreased 1% to 1,827. For Group M, full-time graduate students decreased 11% to 2,748, the number of U.S. citizens is 2,169 (down from 2,428), and the number of first-year students is 1,244 (down from 1,266). Group IV reported full-time graduate students as 5,416, up from 5,065.

**Figure GS.1: Graduate Students by Department Groupings**



**Total Graduate Students: 20,678**

- Full-time graduate students decreased in all groups except Groups Va and IV which increased 12% and 7%, respectively.
- Group I (Pri) had the largest percentage decrease in graduate students with 14% (down 265 from 1,866 to 1,601), while Group M had the largest number decrease—down 342 from 3,090 to 2,748.
- Females account for 36% (7,415) of the full-time graduate students; all groups reported decreases except Groups III, IV and Va.
- First-year graduate students in Groups I (Pub), I (Pri) and M decreased by 13%, 7% and 2% respectively. Group III increased by 9%, all others increased slightly.
- U.S. citizen graduate students decreased 7% across the doctoral mathematics departments.
- Total part-time graduate students in all doctoral mathematics departments combined increased 1%, while Groups M and IV decreased by 2% and Group IV increased by 17%.

**Table GS.2: Full-Time Graduate Students in Groups I, II, III, & Va by Gender and Citizenship, Fall 2006–2011**

	2006	2007	2008	2009	2010	2011
<b>Total full-time graduate students</b>	<b>10984</b>	<b>10937</b>	<b>10883</b>	<b>11286</b>	<b>13048</b>	<b>12514</b>
Female	3279	3249	3193	3248	3839	3773
% Female	30%	30%	29%	29%	29%	30%
% U.S. Citizen	56%	56%	55%	56%	57%	56%
% Underrepresented minorities <sup>1</sup>	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%
<b>Total first-year graduate students</b>	<b>2960</b>	<b>2964</b>	<b>2924</b>	<b>3040</b>	<b>3313</b>	<b>3288</b>
Female	961	950	870	904	1019	1077
% Female	32%	32%	30%	30%	31%	33%
% U.S. Citizen	55%	56%	56%	55%	51%	50%
% Underrepresented minorities	10.0%	10.0%	10.0%	10.0%	9.0%	9.0%

<sup>1</sup> 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 female, and first-year graduate students have dropped this year, after reaching a six-year high last year, as has the percentage of U.S. citizens. The number of full-time and full-time first-year graduate students remain 12% and 11%, respectively, above their level in 2006.



## 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 Group B 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 Groups I, II, III, and Va combined, for Groups M and B, and for Group IV. 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 M is estimated at 4,326 with a standard error of 62. This means the actual number of full-time faculty in Group M is most likely between 4,326 plus or minus two standard errors, or between 4,202 and 4,450. This is much more informative than simply giving the estimate of 4,326.

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 group IV is 22,033, with a standard error of 206.

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).

## Other Sources of Data

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

## Survey Response Rates

### Departmental Profile Department Response Rates

Department Group	Number	Percent	Imputed <sup>1</sup>
Group I (Public)	20 of 25	80%	4
Group I (Private)	21 of 23	91%	2
Group II	51 of 56	91%	4
Group III	66 of 81	81%	8
Group IV (Statistics)	41 of 58	71%	12
Group IV (Biostatistics)	23 of 35	66%	5
Group Va	17 of 21 <sup>2</sup>	77%	2
Group M	70 of 179	39%	50
Group B	263 of 595 <sup>3</sup>	44%	83

<sup>1</sup> See paragraph two under ‘Remarks on Statistical Procedures.’

<sup>2</sup> The population for Group Va is slightly less than for the Doctorates Granted Survey because four programs do not formally “house” faculty, teach undergraduate courses, or award undergraduate degrees.

<sup>3</sup> This is the sampled population, the total population for Group B is 1,012.

## Group Descriptions

The data in this report is presented for departments divided into groups according to several characteristics, the principal one being the highest degree offered in the mathematical sciences. Doctoral-granting departments of mathematics are further subdivided according to their ranking of “scholarly quality of program faculty” as reported in the 1995 publication *Research-Doctorate Programs in the United States: Continuity and Change*.

**Group I** is composed of 48 departments with scores in the 3.00–5.00 range. Group I Public and Group I Private are Group I departments at public institutions and private institutions, respectively.

**Group II** is composed of 56 departments with scores in the 2.00–2.99 range.

**Group III** contains the remaining U.S. departments reporting a doctoral program, including a number of departments not included in the 1995 ranking of program faculty.

**Group IV** contains U.S. departments (or programs) of statistics, biostatistics, and biometrics reporting a doctoral program.

**Group V** contains U.S. departments (or programs) in applied mathematics/applied science, operations research, and management science which report a doctoral program.

**Group Va** is applied mathematics/applied science; Group Vb, which was no longer surveyed as of 1998–99, was operations research and management science.

**Group M** contains U.S. departments granting a master’s degree as the highest graduate degree.

**Group B** 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\\_des](http://www.ams.org/annual-survey/groups_des).