This report presents a profile of mathematical sciences (MS) departments at four-year colleges and universities in the United States, as of fall 2016. The information presented includes the numbers of faculty in various categories, undergraduate and graduate course enrollments, numbers of bachelor’s and master’s degrees awarded during the preceding year, and the number of graduate students. Definitions of categorized terms such as “Mathematical Sciences,” “Math,” and “Stats” along with a description of the faculty categories are provided at the end of this report.

Detailed information, including tables on which the graphics are based, is available on the AMS website at [www.ams.org/annual-survey](http://www.ams.org/annual-survey).

**Fall 2016 Departmental Profile Report**

*Amanda L. Golbeck, Thomas H. Barr, and Colleen A. Rose*

The estimated number of full-time faculty in MS for fall 2016 is 25,376. Of these, 22,922 were in Math (up 2% from 22,373 in 2015) and 2,454 were in Stats (up 9.5% from 2,241). Full-time faculty in the Doctoral Math Group increased 4% to 9,437 from 9,059. In Math we estimate that the number of nondoctoral full-time faculty is 3,643, essentially unchanged from 3,615 in 2015, with a standard error of 127. The total part-time faculty in Math is estimated to be 7,889 (with a standard error of 304), relatively unchanged from 7,684. In Stats, the part-time faculty count is estimated to be 272, but the relatively high standard error of 49 permits no conclusion as to whether this figure represents an increase over the 2015 estimate of 233.
Doctoral Faculty

The estimated number of full-time doctoral (i.e., doctorate-holding) faculty in MS is 21,580. In Math this estimate is 19,279 (with a standard error of 127), up 3% from 18,758 for fall 2015; in Stats it is 2,301, up 7% from 2,146. Respectively for Math and Stats, the total doctoral tenured faculty are 11,831 and 1,094 compared to 11,653 and 1,011 for fall 2015. Sixty-five percent of all doctoral tenured faculty in Math are full professors, while 17% of all doctoral faculty are tenure-eligible. Women hold 22% of all doctoral tenured faculty and 18% of doctoral tenured full professor appointments.

Features of full-time doctoral faculty data:

- 74% of all tenured doctoral faculty in the Doctoral Math Group are full professors (3,635), with 71% of these full professor appointments in Math Public departments.
- Over the period fall 2015 to fall 2016, tenure-eligible doctoral faculty increased 6% among the Doctoral Math Group, while the Biostatistics, Masters, and Bachelors Groups showed decreases of 1%, 2%, and 3%, respectively.
- Postdoctoral appointments among the Doctoral Math Group increased to 1,289 for fall 2016. This is a 5% increase from 2015 and 15% of the total full-time doctoral faculty in these departments. In Stats postdocs decreased 21% to 180.

Features of part-time doctoral faculty data:

- Women hold 22% of all postdoctoral appointments, up from 21% from fall 2015.
- 16% of the doctoral faculty in the Doctoral Math Group are in non-tenure-track positions. The majority of these faculty hold renewable (81%) and fixed-term appointments (17%); in 2015 these percentages were 79% and 17%, respectively.

Features of part-time doctoral faculty data:

- Estimated total part-time doctoral faculty decreased 7% to 1,973 from 2,075. Of these, 28% receive benefits, and 7% are in phased retirement.
- 30% of all part-time doctoral faculty are in Doctoral Math departments.
- Women hold 29% of all part-time doctoral faculty positions, the same as in fall 2015.
Nondoctoral Faculty

The estimated number of nondoctoral (i.e., without a doctorate) full-time faculty in MS is 3,796, of which 3,643 are in Math and 153 are in Stats. This count is up 2% from 2015, and it represents 15% of all full-time faculty. In Math, nondoctoral tenured faculty increased 4% from 296 to 308; in Stats one nondoctoral tenured faculty member was reported. One hundred twenty-four of the nondoctoral full-time faculty in Math are tenure-eligible, 4% of all those tenure-eligible. Nondoctoral full-time non-tenure-track faculty increased 3% to 3,361; this is 88% of all nondoctoral full-time faculty, the same as fall 2015. Women composed 55% of all nondoctoral faculty, the same as fall 2015.

Features of full-time nondoctoral faculty data:

- 35% of all tenured nondoctoral faculty in MS are full professors (109) and 75% of these appointments are in the Bachelors Group. Stats reported no faculty in this category.
- Masters and Bachelors departments combined reported the majority of the nondoctoral non-tenure-track faculty holding renewable and fixed-term appointments with 71% and 80%, respectively.
- Women account for 55% of full-time nondoctoral faculty in Math. By comparison, women account for 26% of all doctoral full-time faculty and 30% of all full-time faculty in Math.

Features of part-time nondoctoral faculty data:

- Total part-time nondoctoral faculty increased 2% to 5,974 from 5,842 last year. Of these faculty, 24% receive benefits and 2% are in phased retirement.
- 76% of all part-time faculty are nondoctoral; women hold 47% of these positions.
- Part-time nondoctoral faculty decreased 5% to 772 in Doctoral Math departments, this is 57% of all part-time faculty in this group.

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

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

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

Figure ND.4: Gender of Full-time Nondoctoral Faculty

Total: 3,796
Women Faculty

Women account for 31% (7,793) of all full-time faculty in MS. In Math, women made up 30% (6,966 with a standard error of 96) of the full-time faculty (22,922) in fall 2016. For the Doctoral Math departments, women composed 17% of the combined doctorate-holding tenured and tenure-eligible faculty and 33% of the doctorate-holding non-tenure-track (including postdocs) faculty in fall 2016. In the other groups these respective percentages are: 23% and 38% in Statistics, 30% and 51% in Biostatistics, 28% and 33% in Masters, and for Bachelors faculty they are 31% and 33%. Among the nondocotoral full-time faculty in Math, women compose 55%. Women account for 42% of all part-time faculty in Math.

Features of full-time women faculty data:

- Women hold 14% of full-time tenured and 26% of full-time tenure-eligible positions in Doctoral Math departments.
- 42% of all full-time women faculty are in the Bachelors departments.
- Biostatistics departments reported the highest percentage of full-time women faculty (41%), followed by the Bachelors departments (36%), and Masters (34%), while the Math Private Large Group reported the lowest (15%).
- Women hold 22% of all postdoctoral appointments (up from 21% in 2015). Forty-eight percent of postdocs in Biostatistics are held by women. The majority of the Doctoral Math groups reported between 20% and 28% of postdocs were held by women, with only Math Public Small and Math Private Large reporting fewer women in these positions with 15% and 19%, respectively.
- 87% of all women nondocotoral non-tenure-track faculty appointments (1,916) are renewable; 10% are fixed-term, and 2% are other types of appointments.

Features of part-time women faculty data:

- 58% of all part-time women faculty in Math are in Bachelors departments.
- 83% of all part-time women faculty hold nondocotoral positions. Of these faculty, 23% receive benefits and 1% are phased retirements.
Undergraduate Course Enrollments

The 2016 estimate of total undergraduate enrollments in MS courses is 2,518,000. With a standard error of 26,000, this figure cannot be used to conclude that enrollments have changed significantly from the 2015 estimate of 2,487,000. MS departments reported an overall decrease of 4% in the number of undergraduate course enrollments per full-time faculty member.

Estimated total graduate course enrollments have increased from 110,000 to 113,000 (with a standard error of 5,000). MS departments reported an overall decrease of 1% in the estimated number of graduate course enrollments per full-time tenured and tenure-eligible faculty member.
Bachelor’s Degrees Awarded

For the period 2015–16, the estimated number of bachelor’s degrees awarded in MS departments is 34,219, up 13% from the 2014–15 estimate of 30,397. The standard error is 825. Of these, 13,578 were earned by women (40%), a 9% increase. In Math Departments, the 2015–16 estimated number of bachelor’s degrees awarded is 32,382, a count that includes 12,800 degrees earned by women, 24,393 Math degrees, 2,918 Math Ed degrees, 775 Statistics-only degrees, 2,469 Computer-Science-only degrees, and 1,827 other degrees. Approximately 12,800 of these degrees were earned by women. This figure represents an 11% increase from last year’s estimate of 29,101 degrees awarded by Math departments. The new breakdown of degrees awarded by major accounts for at least 50% (1,922 Other degrees) of the increase in total degrees awarded.

Here are some of the highlights regarding bachelor degrees:

- All department groupings reported increases in the number of undergraduate degrees awarded.
- 40% (13,578) of all bachelor’s degrees, 61% (1,773) of mathematics education degrees, and 21% (525) of computer science degrees were earned by women.
- Of all degrees in mathematics (24,475, 72% of all bachelors),
  - 50% (12,258) were awarded in the Doctoral Math group; 36% of these degrees were awarded to women.
  - 35% (8,571) were awarded in Bachelors departments, and 44% of these were to women.
  - 15% (3,564) were awarded in Masters departments, and 33% of these were to women.
- Of all degrees in statistics (2,435, or 7% of all bachelors),
  - 68% (1,660) were awarded in departments of Statistics or Biostatistics
  - 43% (1,055) were awarded to women
- Of degrees in Computer Science awarded in mathematical sciences departments (2,469, 7% of bachelors awarded), 77% (1,911) were awarded in the Bachelors Group, and 22% of these were to women.

Figure UD.1: Undergraduate Degrees Awarded by Major and Department Grouping
(Degrees awarded between July 1, 2015 and June 30, 2016)

Figure UD.2: Undergraduate Degrees Awarded by Major and Gender
(Degrees awarded between July 1, 2015 and June 30, 2016)
For the period 2015–2016, the estimated number of master's degrees awarded in MS departments is 7,954, an increase of 12% over the 2014–2015 estimate of 7,132. The standard error in this estimate is 722. Of these, 3,203 or 40% were earned by women, a 6% increase over the 2014–2015 estimate consisting of 3,034. In Math departments, the estimated number of master’s degrees awarded is 5,360, a count estimate consisting of 3,186 Math degrees, 423 Math Ed degrees, 816 Statistics-only degrees, 679 Computer-Science-only degrees, and 256 other degrees. Approximately 2,034 of these are earned by women. This figure represents a 5% increase over last year's estimate of 5,087 masters degrees awarded by Math departments.

Here are a few highlights regarding the masters degrees:

- All department groupings reported increases in the number of masters degrees awarded except Math Public Medium and Small, which had decreases of 7% and 1%, respectively.
- 34% (2,742) of masters degrees were in statistics.
- 29% (2,287) of masters degrees were awarded by Masters departments, 25% (1,954) by Statistics, and 9% by Math Public Small.
- 40% of all masters degrees were awarded to women, with the lowest rate of 30% (1,015) among math majors and the highest rate of 66% (279) among mathematics education majors.
• 43% (3,408) of masters degrees represented were awarded in mathematics
  ◦ 27% (932) of these were awarded by Master departments
  ◦ 29% (268) of these were awarded to women.
• 5% (423) of masters degrees were in mathematics education.
  ◦ 54% (227) of these were awarded by Masters departments
  ◦ Women earned 66% of all mathematics education degrees
• 9% (679) of masters degrees in mathematical sciences departments were in computer science.
  ◦ 94% (635) of CS masters were awarded by the Masters Group; 33% of these went to women.
  ◦ Masters in CS conferred by the Masters Group of departments more than doubled to 635 from 2014–15, but most other groups saw decreases.

Figure MD.3: Master’s Degrees Awarded*

• 43% (3,408) of masters degrees represented were awarded in mathematics
  ◦ 27% (932) of these were awarded by Master departments
  ◦ 29% (268) of these were awarded to women.
• 5% (423) of masters degrees were in mathematics education.
  ◦ 54% (227) of these were awarded by Masters departments
  ◦ Women earned 66% of all mathematics education degrees
• 9% (679) of masters degrees in mathematical sciences departments were in computer science.
  ◦ 94% (635) of CS masters were awarded by the Masters Group; 33% of these went to women.
  ◦ Masters in CS conferred by the Masters Group of departments more than doubled to 635 from 2014–15, but most other groups saw decreases.

Figure MD.3: Master's Degrees Awarded1, 2011–2016
All Mathematics Departments

Graduate Students

In fall 2016, the total number of full-time graduate students is estimated at 23,813, with 16,305 in Math (essentially unchanged from 16,136 in fall 2015) and 7,508 in Stats. The total number of full-time graduate students in Doctoral Math departments is 13,702 (from 13,431). In Doctoral Math departments, counts of full-time and first-year graduate students who are US citizens or permanent residents have remained essentially unchanged at 7,131 and 1,779, respectively. For the Masters Group, full-time graduate students decreased 4% to 2,603, the number of US citizens and permanent residents is 1,762 (down from 1,930), and the number of first-year students is 1,155 (down from 1,203). Stats reported full-time first-year graduate students at 2,543, up from 2,538. Women account for 36% (8,684) of all full-time graduate students.
Underrepresented minorities accounted for 13% of US citizen and permanent resident graduate students and 5% of first-year graduate students. Women compose 35% and 39%, respectively, of these categories.

Math Public Small, Math Private Large, Applied Math, and the Statistics Groups all reported increase in underrepresented minorities, while Math Public Large, Math Public Medium, Math Private Small and Biostatistics all reported decreases of 32%, 22%, 39%, and 6%, respectively.

Non-US citizen full-time graduate students increased in all groups except Applied Math which remained relatively unchanged and full-time women graduate student counts increased in all groups except Masters which decreased 6%.

Features of part-time graduate student data:

- Estimates of total part-time graduate student counts increased in the Math Public Small, Math Private Small, Biostatistics, and Masters Groups, while Math Public Large, Math Public Medium, Math Private Large, Applied Math, and Statistics estimates decreased by 22%, 12%, 21%, 8%, and 44%, respectively.
- Part-time US citizen and permanent resident graduate student counts decreased slightly to 3,381 and non-US citizen counts decreased 8% to 665.
- Underrepresented minorities account for 14% of part-time US citizen and permanent resident graduate students, down from 16% in all 2015).

Table GS.2: Full-Time Graduate Students in All Doctoral Math Groups Combined by Gender and Citizenship, Fall 2007–2016

<table>
<thead>
<tr>
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<tr>
<td><strong>Total full-time graduate students</strong></td>
<td>10837</td>
<td>10883</td>
<td>11286</td>
<td>13048</td>
<td>12514</td>
<td>12684</td>
<td>12861</td>
<td>13023</td>
<td>13431</td>
<td>13702</td>
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<tr>
<td>Women</td>
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<td>3193</td>
<td>3248</td>
<td>3839</td>
<td>3771</td>
<td>3969</td>
<td>3925</td>
<td>4039</td>
<td>4093</td>
<td>4146</td>
</tr>
<tr>
<td>% Women</td>
<td>30%</td>
<td>29%</td>
<td>29%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>% US Citizen &amp; Permanent Residents</td>
<td>56%</td>
<td>55%</td>
<td>56%</td>
<td>57%</td>
<td>56%</td>
<td>54%</td>
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</tr>
<tr>
<td>% Underrepresented minorities&lt;sup&gt;1&lt;/sup&gt;</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>11%</td>
<td>8%</td>
<td>8%</td>
<td>9%</td>
<td>11%</td>
<td>15%</td>
<td>13%</td>
</tr>
<tr>
<td><strong>Total first-year graduate students</strong></td>
<td>2964</td>
<td>2924</td>
<td>3040</td>
<td>3113</td>
<td>3208</td>
<td>3384</td>
<td>3623</td>
<td>3651</td>
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<tr>
<td>Women</td>
<td>850</td>
<td>870</td>
<td>904</td>
<td>1019</td>
<td>1077</td>
<td>1036</td>
<td>1205</td>
<td>1193</td>
<td>1188</td>
<td>1200</td>
</tr>
<tr>
<td>% Women</td>
<td>32%</td>
<td>30%</td>
<td>30%</td>
<td>31%</td>
<td>33%</td>
<td>31%</td>
<td>33%</td>
<td>34%</td>
<td>33%</td>
<td>32%</td>
</tr>
<tr>
<td>% US Citizen &amp; Permanent Residents</td>
<td>56%</td>
<td>56%</td>
<td>55%</td>
<td>51%</td>
<td>50%</td>
<td>54%</td>
<td>53%</td>
<td>55%</td>
<td>53%</td>
<td>52%</td>
</tr>
<tr>
<td>% Underrepresented minorities&lt;sup&gt;1&lt;/sup&gt;</td>
<td>10%</td>
<td>10%</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>7%</td>
<td>10%</td>
<td>13%</td>
<td>14%</td>
<td>12%</td>
</tr>
</tbody>
</table>

<sup>1</sup> Starting with 2014, departments were asked to report US citizen and permanent resident counts together; previously permanent residents were included in the non-US citizen counts. All percentages prior to 2014 have been updated to allow for comparison with previous years’ data.

<sup>2</sup> Prior to 2014 these counts only included US Citizens. Underrepresented minorities includes any person having origins within the categories American Indian or Alaskan Native, Black or African American, Hispanic or Latino, and Native Hawaiian or Other Pacific Islander.
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., only 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. These faculty hold appointments that are renewable (potentially unlimited), fixed-term but not renewable, or temporary. Typical titles for these positions are 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, paid by the course, and/or those in phased retirement.

Department Groupings

In this report, Mathematical Sciences departments are those in four-year institutions in the US that refer to themselves with a name that incorporates (with a few exceptions) “Mathematics” or “Statistics” in some form. For instance, the term includes, but is not limited to, departments of “Mathematics,” “Mathematical Sciences,” “Mathematics and Statistics,” “Mathematics and Computer Science,” “Applied Mathematics,” “Statistics,” and “Biostatistics.” Also, Mathematics (Math) refers to departments that (with exceptions) have “mathematics” in the name; Stats refers to departments that incorporate (again, with exceptions) “statistics” or “biostatistics” in the name but do not use “mathematics.”

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

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

**Math Public Small** consists of departments with an annual rate of production of PhDs of 3.8 or less per year.

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

**Math Private Small** consists of departments with an annual rate of production of PhDs 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.

**Masters** contains US departments granting a master’s degree as the highest graduate degree.

**Bachelors** contains US departments granting a baccalaureate degree only.

**Doctoral Math** contains all US math public, math private, and applied math mathematics departments granting a PhD as the highest graduate degree.

**Mathematics (Math)** contains all Math Public, Math Private, and Applied Math, Masters, and Bachelors Groups above.

**Stats** consists of all doctoral-degree-granting statistics and biostatistics departments.

Listings of the actual departments that compose these groups are available on the AMS website at [www.ams.org/annual-survey/groups](http://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, Masters, and Bachelors departments in the US.

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 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 nonresponses are then made to arrive at the estimates reported for the entire grouping.

Standard errors were calculated for some of the key estimates for the Doctoral Math Group (Math Public, Math Private, and Applied Math), and for the Masters, Bachelors, Statistics, and Biostatistics Groups. 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 the Masters Group is estimated at 4,343 with a standard error of 107. This means the actual number of full-time faculty in the Masters Group is most likely between 4,343 plus or minus two standard errors, or between 4,129 and 4,557. This is much more informative than simply giving the estimate of 4,343.

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 22,373, with a standard error of 205.

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

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<th>Departmental Profile</th>
<th>Department Response Rates</th>
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<td>Department Group</td>
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<td>Math Public Large</td>
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<tr>
<td>Math Public Medium</td>
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<tr>
<td>Math Public Small</td>
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<td>Math Private Large</td>
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<tr>
<td>Math Private Small</td>
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</tr>
<tr>
<td>Applied Math</td>
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</tr>
<tr>
<td>Statistics</td>
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</tr>
<tr>
<td>Biostatistics</td>
<td>31 of 44²</td>
</tr>
<tr>
<td>Masters</td>
<td>161 of 175</td>
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<tr>
<td>Bachelors</td>
<td>545 of 1,012</td>
</tr>
<tr>
<td>Total</td>
<td>944 of 1,501</td>
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</tbody>
</table>

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.