

ACM-NDC Study 2015–2016:

Fourth Annual Study of Non-Doctoral-Granting Departments in Computing

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In winter of 2016, ACM conducted its fourth annual survey of non-Doctoral granting (NDC) academic departments in computing (NDC). The survey comprised recent degrees, enrollments, faculty demographics, and faculty salaries and included gender and ethnic diversity characteristics of the faculty and the students in the computing programs. The annual ACM-NDC Study (a survey of “Non-Doctoral-Granting Departments in Computing”), is intended to be an annual complement to the Computing Research Association (CRA) Taulbee Survey of Ph.D.-granting departments in computing [6]. ACM-NDC is funded by ACM (with generous original seed funding from Google), and continues to be conducted with support from the CRA, the Association for Information Systems (AIS) [1], and ACM SIGITE [2]. The authors of this article comprise the NDC Steering Committee. As an annual study, NDC helps fill gaps in data on non-Taulbee programs to present a more complete view of the academic landscape in computing and to expand pipeline information on programs that produce candidates for Ph.D. programs as well as the private and public labor markets. The timely reporting of the survey’s results provides the community with an early look at workforce-related facts and trends of importance to academic programs and those who rely on them. This article reports the results of the NDC survey, with comparisons and contrasts to data reported in the Taulbee Survey and, as appropriate, previous NDC survey results.

The goals of ACM-NDC are to document trends in student enrollment, degree production, faculty demographics, and faculty salaries at not-for-profit U.S. academic institutions that grant bachelor's and/or master's degrees (but not doctorates) in the five major computing disciplines: computer science (CS), computer engineering (CE), information systems (IS), information technology (IT), and software engineering (SE). Diversity statistics and trends with respect to students and faculty are important features of this documentation.

The survey was distributed in January 2016 to qualifying programs identified using data in the Integrated Post-secondary Education Data System (IPEDS) [4]. This data is collected annually by the National Center for Education Statistics (NCES) from all US institutions that participate in the federal financial aid programs [6]. This year the survey was distributed to 1,071 academic units (departments, schools, or institutions) identified via IPEDS as offering at least one program in computing. In some cases, a single institution received multiple surveys if programs are housed in different schools or departments. In total, 152 units participated in the survey to some extent, supplying either partial or complete information. Of these, 121 units supplied bachelor's data (compared to 158 in 2015-16) and data was reported for 233 total programs (193 bachelor's and 40 master's programs), compared to 291 last year. Of the institutions responding, 131 academic units provided data on faculty (140 in 2014-15) and 72 provided faculty salary information (92 in 2014-15).

For the second year in a row, there was some drop-off in overall programs represented as well as faculty salary data. It's worth mentioning that while awareness of NDC has grown, many of the academic units at the generally smaller schools targeted by NDC continue to face challenges in gathering and submitting data. Some of these challenges have been known to us—such as shortage of resources at smaller departments, time required to conduct data gathering, department reorganization, and data privacy concerns. We tried to address some of these challenges in 2015-16, with improvements to validation and user interface, an increase in historical reference data, and some reduction in the overall length of the survey. This year, we also faced the additional challenge of including a separate survey, conducted in partnership with the CRA Committee on Booming Enrollments [3]. This separate “Enrollment” survey collected valuable data from bachelor's level computer science programs that will inform the ongoing work of both ACM and CRA. Although we cannot know for certain, it's quite possible that the increased burden of two surveys may have detracted somewhat from engagement with the NDC alone. The timing of our NDC survey, during the spring semester, also may be a factor in the overall response rate. This summer, the NDC Committee plans to contact non-responding institutions to learn how we can further add value and reduce remaining barriers to participation. We are optimistic that the response rate for the next wave of NDC will climb from 2015-16 levels.

The following is a preliminary summary of some key NDC findings. Data are compared primarily to last year's findings and to findings from doctoral programs reported in the most re-

cent Taulbee Survey. As this is only the fourth year of the NDC survey, longitudinal trend analysis of its data may still be premature, but where appropriate we include comments reflecting multiple years of NDC data. In some parts of the survey, small response sizes make it difficult to do meaningful comparisons with other data. When reading this report, please consider the following points.

- We use the term “academic unit” (or unit) to denote the administrative division responsible for one or more qualifying programs. We use the term “program” to refer to a course of study leading to a degree in one of the computing disciplines—computer science (CS), computer engineering (CE), information systems (IS), information technology (IT), or software engineering (SE).
- A given academic unit may offer multiple programs.
- Degree production (master's and bachelor's) refers to the prior academic year (2014-15).
- Data for current faculty as well as new students in all categories refer to the current academic year (2015-16) for which the survey is given.
- Total enrollment (master's and bachelor's) data are reported for both 2014-15 and 2015-16. Please note that 2015-16 enrollment data comes from academic units responding in 2015-16, while 2014-15 numbers come from last year's group of respondents.

BACHELOR'S DEGREE PRODUCTION AND ENROLLMENTS

Table B1 summarizes the number of institutions responding to the bachelor's portion of the survey. There was a slightly lower percentage of public (35.5% vs. 38.0%) and master's granting (24.0% vs. 26.6%) institutions responding than in 2015. Table B2 presents a breakdown of programs among respondents by discipline and institution type. The total number of degree programs offered by the responding units is 193, much lower than the 248 programs that were represented in the 2014-2015 survey. While the distribution of the 193 programs across the five disciplines is similar to last year, there was a large drop in the number of IS programs reporting this year (26 vs. 43). Caution should be taken in drawing too many conclusions from the comparison of 2014-2015 and 2015-2016 survey results due to low numbers of reporting programs in areas other than CS. In those tables that report data from institutions responding in consecutive years, consistent trends over the years of NDC reporting are noted.

TABLE B1. BREAKDOWN OF ACADEMIC UNITS RESPONDING TO BACHELOR'S SECTION OF SURVEY

| | Number of Programs | % of Total Responses |
|----------------------|--------------------|----------------------|
| Yes | 121 | 11.3% |
| No | 950 | 88.7% |
| Total Surveys | 1071 | |
| Public | 43 | 35.5% |
| Private | 78 | 64.5% |
| Total Yes | 121 | |
| Master's | 29 | 24.0% |
| Non-Master's | 92 | 76.0% |
| Total Yes | 121 | |

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TABLE B2. SUMMARY OF PROGRAM OFFERINGS

| | Overall | | | | Public | | | Private | | | Master's | | | Non-Master's | | |
|---------------|-----------------|--------------------|-------------|---------------|--------------------|-------------|---------------|--------------------|-------------|---------------|--------------------|-------------|---------------|--------------------|-------------|---------------|
| | Number of Units | Number of Programs | % of Total | % ABET | Number of Programs | % of Total | % ABET | Number of Programs | % of Total | % ABET | Number of Programs | % of Total | % ABET | Number of Programs | % of Total | % ABET |
| CS | 112 | 130 | 67.4% | 20.0% | 42 | 60.0% | 38.1% | 88 | 71.5% | 11.4% | 37 | 59.7% | 35.1% | 93 | 71.0% | 14.0% |
| CE | 7 | 7 | 3.6% | 100.0% | 5 | 7.1% | 100.0% | 2 | 1.6% | 100.0% | 4 | 6.5% | 100.0% | 3 | 2.3% | 100.0% |
| IS | 26 | 26 | 13.5% | 7.7% | 8 | 11.4% | 12.5% | 18 | 14.6% | 5.6% | 8 | 12.9% | 12.5% | 18 | 13.7% | 5.6% |
| IT | 18 | 21 | 10.9% | 4.8% | 11 | 15.7% | 0.0% | 10 | 8.1% | 10.0% | 11 | 17.7% | 0.0% | 10 | 7.6% | 10.0% |
| SE | 8 | 9 | 4.7% | 22.2% | 4 | 5.7% | 25.0% | 5 | 4.1% | 20.0% | 2 | 3.2% | 0.0% | 7 | 5.3% | 28.6% |
| Totals | 121 | 193 | 100% | 19.70% | 70 | 100% | 32.90% | 123 | 100% | 12.20% | 62 | 100% | 29.00% | 131 | 100% | 15.30% |

Also appearing in Table B2 are the percentages of programs in each discipline that are ABET accredited. All seven computer engineering programs reporting are ABET accredited, while only 20% of reporting CS programs are accredited. CS programs tend to be ABET accredited more frequently at public (rather than at private) institutions and at master's-granting (rather than at non-master's-granting) institutions.

Table B3A shows actual degree production in 2014–2015 and anticipated change in that production for 2015–2016 broken down by institution type. Across all institution types, the anticipated increases of 24.7% in computer science and 18.0% across all disciplines are higher than those reported last year (21.7% and 15.9%, respectively), but lower than those reported at Taulbee institutions (25.8% and 21.0%, respectively). Increases are anticipated to be higher at private institutions than public when aggregated over all discipline types (23.3% vs. 14.2%); however, in computer science this difference is much less pronounced (25.6% vs. 23.9%). In computer science, anticipated increases are higher at master's-granting institutions (27.4% vs. 22.7%), but there is little difference between master's-granting and non-master's-granting institutions when aggregating across all disciplines (17.8% vs. 18.1%).

For units that responded to both this year's and last year's NDC, Table B3B includes actual degree production change for the period 2013–2014 to 2014–2015 in addition to anticipated change in 2015–2016, again broken down by institution type. The

year-to-year change in degree production was 17.7% in computer science and 17.2% across all disciplines. By comparison with Taulbee schools, change in actual degree production was equal in computer science (17.7%) and lower when aggregated across all discipline types (17.2% vs. 22.2%). Actual degree production in computer science increased by a greater percentage in public institutions than private (18.6% vs. 16.4%) and in non-master's-granting schools than master's-granting (19.7% vs. 15.3%). Across all disciplines, actual degree production increased by a greater percentage at private vs. public institutions (19.6% vs. 15.6%) and non-master's-granting vs. master's-granting schools (22.2% vs. 12.3%). Anticipated changes in degree production for 2015–2016 are 24.8% in computer science and 15.9% across all disciplines. Expected changes in computer science are slightly higher at public institutions than private (25.1% vs. 24.3%) and are higher at master's-granting schools than non-master's-granting (27.4% vs. 22.6%). Across all disciplines, anticipated degree production is reported to be similar at public vs. private institutions (16.0% vs. 15.7%) and higher at master's-granting vs. non-master's-granting schools (19.2% vs. 12.8%).

Degree production and anticipated change data are broken down by discipline in Table B4. When all of this year's respondents are included, degree production is anticipated to increase in all disciplines except IT. The rate of increase is anticipated to be higher than that predicted last year in CS, CE, and IS (differences of 3.0%, 2.9%, and 10.0%, respectively), but lower in IT

TABLE B3A. DEGREE PRODUCTION AND ANTICIPATED CHANGE BY INSTITUTION TYPE - ALL RESPONDENTS

| | All Respondents | | | | | | | | | | | | | | |
|-----------------------|-----------------|--------------------|------------------|-------------------------------|---------------------|-------------------------------|--------------------------------|-----------------|--------------------|------------------|-------------------------------|---------------------|-------------------------------|--------------------------------|--|
| | CS Only | | | | | | | All Disciplines | | | | | | | |
| | Number of Units | Number of Programs | 2014–2015 actual | 2014–2015 Average per Program | 2015–2016 projected | 2015–2016 Average per Program | 2015–2016 Anticipated % Change | Number of Units | Number of Programs | 2014–2015 actual | 2014–2015 Average per Program | 2015–2016 projected | 2015–2016 Average per Program | 2015–2016 Anticipated % Change | |
| Public | 36 | 39 | 923 | 23.7 | 1,144 | 29.3 | 23.9% | 39 | 65 | 1,535 | 23.6 | 1,753 | 27.0 | 14.2% | |
| Private | 68 | 83 | 861 | 10.4 | 1,081 | 13.0 | 25.6% | 74 | 117 | 1,082 | 9.2 | 1,334 | 11.4 | 23.3% | |
| Master's | 24 | 33 | 767 | 23.2 | 977 | 29.6 | 27.4% | 25 | 56 | 1,239 | 22.1 | 1,459 | 26.1 | 17.8% | |
| Non-Master's | 80 | 89 | 1,017 | 11.4 | 1,248 | 14.0 | 22.7% | 88 | 126 | 1,378 | 10.9 | 1,628 | 12.9 | 18.1% | |
| NDC Overall | 104 | 122 | 1,784 | 14.6 | 2,225 | 18.2 | 24.7% | 113 | 182 | 2,617 | 14.4 | 3,087 | 17.0 | 18.0% | |
| Taulbee (US CS Depts) | 136 (125*) | NA** | 13,514 | 99.4 | 15,621 | 114.9 | 25.8% | 155 (138*) | NA** | 19,720 | 127.2 | 21,243 | 137.1 | 21.0% | |

*Note: Taulbee CS data excludes departments from Canadian institutions and had fewer departments report projected degree production than actual

**Note: Taulbee only produces averages per department

TABLE B3B. DEGREE PRODUCTION AND ANTICIPATED CHANGE BY INSTITUTION TYPE - UNITS RESPONDING BOTH YEARS

| | Units Responding Both Years | | | | | | | | | |
|-----------------------|-----------------------------|--------------------|------------------|-------------------------------|------------------|-------------------------------|---------------------------|---------------------|-------------------------------|--------------------------------|
| | CS Only | | | | | | | | | |
| | Number of Units | Number of Programs | 2013-2014 actual | 2013-2014 Average per Program | 2014-2015 actual | 2014-2015 Average per Program | 2014-2015 Actual % Change | 2015-2016 projected | 2015-2016 Average per Program | 2015-2016 Anticipated % Change |
| Public | 22 | 25 | 547 | 21.9 | 649 | 26.0 | 18.6% | 812 | 32.5 | 25.1% |
| Private | 40 | 50 | 420 | 8.4 | 489 | 9.8 | 16.4% | 608 | 12.2 | 24.3% |
| Master's | 12 | 18 | 450 | 25.0 | 519 | 28.8 | 15.3% | 661 | 36.7 | 27.4% |
| Non-Master's | 50 | 57 | 517 | 9.1 | 619 | 10.9 | 19.7% | 759 | 13.3 | 22.6% |
| NDC Overall | 62 | 75 | 967 | 12.9 | 1,138 | 15.2 | 17.7% | 1,420 | 18.9 | 24.8% |
| Taulbee (US CS Depts) | 118 | NA* | 13,561 | 114.9 | 15,966 | 135.3 | 17.7% | NA** | NA** | NA** |

| | Units Responding Both Years | | | | | | | | | |
|-----------------------|-----------------------------|--------------------|------------------|-------------------------------|------------------|-------------------------------|---------------------------|---------------------|-------------------------------|--------------------------------|
| | All Disciplines | | | | | | | | | |
| | Number of Units | Number of Programs | 2013-2014 actual | 2014-2014 Average per Program | 2014-2015 actual | 2014-2015 Average per Program | 2014-2015 Actual % Change | 2015-2016 projected | 2015-2016 Average per Program | 2015-2016 Anticipated % Change |
| Public | 22 | 37 | 820 | 22.2 | 948 | 25.6 | 15.6% | 1,100 | 29.7 | 16.0% |
| Private | 43 | 74 | 542 | 7.3 | 648 | 8.8 | 19.6% | 750 | 10.1 | 15.7% |
| Master's | 13 | 30 | 692 | 23.1 | 777 | 25.9 | 12.3% | 926 | 30.9 | 19.2% |
| Non-Master's | 52 | 81 | 670 | 8.3 | 819 | 10.1 | 22.2% | 924 | 11.4 | 12.8% |
| NDC Overall | 65 | 111 | 1,362 | 12.3 | 1,596 | 14.4 | 17.2% | 1,850 | 16.7 | 15.9% |
| Taulbee (US CS Depts) | 144 | NA* | 16,333 | 113.4 | 19,964 | 138.6 | 22.2% | NA** | NA** | NA** |

*Note: Taulbee only provides averages per department

**Note: Taulbee does not report expected degrees for departments responding both years

TABLE B4. DEGREE PRODUCTION AND ANTICIPATED CHANGE BY DISCIPLINE

| | All Respondents | | | | | | |
|-------------|-----------------|--------------------|------------------|-------------------------------|---------------------|-------------------------------|--------------------------------|
| | Number of Units | Number of Programs | 2014-2015 actual | 2014-2015 Average per Program | 2015-2016 projected | 2015-2016 Average per Program | 2015-2016 Anticipated % Change |
| NDC Overall | 113 | 182 | 2,617 | 14.4 | 3,087 | 17.0 | 18.0% |
| CS | 104 | 122 | 1,784 | 14.6 | 2,225 | 18.2 | 24.7% |
| CE | 7 | 7 | 121 | 17.3 | 129 | 18.4 | 6.6% |
| IS | 24 | 24 | 279 | 11.6 | 282 | 11.8 | 1.1% |
| IT | 17 | 20 | 322 | 16.1 | 296 | 14.8 | -8.1% |
| SE | 8 | 9 | 111 | 12.3 | 155 | 17.2 | 39.6% |

| | Units Responding Both Years | | | | | | | | | |
|-------------|-----------------------------|--------------------|------------------|-------------------------------|------------------|-------------------------------|---------------------------|---------------------|-------------------------------|--------------------------------|
| | Number of Units | Number of Programs | 2013-2014 actual | 2013-2014 Average per Program | 2014-2015 actual | 2014-2015 Average per Program | 2014-2015 Actual % Change | 2015-2016 projected | 2015-2016 Average per Program | 2015-2016 Anticipated % Change |
| NDC Overall | 65 | 111 | 1,362 | 12.3 | 1,596 | 14.4 | 17.2% | 1,850 | 16.7 | 15.9% |
| CS | 62 | 75 | 967 | 12.9 | 1,138 | 15.2 | 17.7% | 1,420 | 18.9 | 24.8% |
| CE | 4 | 4 | 84 | 21.0 | 78 | 19.5 | -7.1% | 91 | 22.8 | 16.7% |
| IS | 15 | 15 | 73 | 4.9 | 96 | 6.4 | 31.5% | 81 | 5.4 | -15.6% |
| IT | 9 | 10 | 174 | 17.4 | 199 | 19.9 | 14.4% | 187 | 18.7 | -6.0% |
| SE | 6 | 7 | 64 | 9.1 | 85 | 12.1 | 32.8% | 71 | 10.1 | -16.5% |

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and SE (differences of -16.8% and -3.3%, respectively). When comparing units reporting in consecutive years in 2015-2016 to those reporting in consecutive years in 2014-2015, actual degree production increases were higher when aggregated across all disciplines (17.2% vs. 16.3%), in CS (17.7% vs. 11.8%), in IS (31.5% vs. 23.3%), and in SE (32.8% vs. -3.3%). In computer engineering, the actual degree production decline of 7.1% is a wild swing from the 54.8% increase reported in 2014-2015. It should be noted, however, that there are only four CE programs reporting this data in 2015-2016 and there were only three reporting in 2014-2015. In information technology, anticipated degree production was lower than reported last year (14.4% vs. 27.8%). Anticipated degree production among those reporting both years is higher across all program types (15.9% vs. 13.2%), in CS (24.8% vs. 16.4%) and in CE (16.7% vs. 0.0%). Large decreases are seen in these percentages for IS (-15.6% vs. -1.3%), IT (-6.0% vs. 10.0%) and SE (-16.5% vs. 24.1%).

For the first time in the history of the NDC, overall percentages of female degree recipients in NDC was equal to that reported by Taulbee (16.3%) rather than higher (Table B5). In CS, NDC institutions continue to report higher percentages of females than Taulbee (17.4% vs. 15.7%), but in computer engineering NDC institutions report a lower percentage of females than Taulbee (6.6% vs. 11.6%). Again, there was a small number (seven) of CE programs reporting this data. It is notable that in all four years of the NDC survey, private institutions have reported higher percentages of females in CS and lower percentages of females in SE than public institutions.

Consistent with all previous years of this report, NDC schools report higher percentages of degree production than Taulbee institutions for Hispanic/Latino (8.6% vs. 8.1%), Black/African-American (6.3% vs. 4.6%), and White (64.8% vs. 54.2%) students (Table B6). Also consistent over the past four years, percentages of Asian and Non-Resident students at NDC

TABLE B5. BACHELOR'S DEGREES AWARDED BY GENDER, DISCIPLINE, AND INSTITUTION TYPE

| | Male | | Female | | Total Known Gender | Gender Unknown | Grand Total | Number of Units | Number of Programs |
|-----------------|--------|------------|--------|------------|--------------------|----------------|-------------|-----------------|--------------------|
| | Count | Percentage | Count | Percentage | | | | | |
| CS Overall | 1,440 | 82.6% | 303 | 17.4% | 1,743 | 140 | 1,883 | 109 | 127 |
| CS Public | 782 | 87.3% | 114 | 12.7% | 896 | 105 | 1,001 | 38 | 41 |
| CS Private | 658 | 77.7% | 189 | 22.3% | 847 | 35 | 882 | 71 | 86 |
| CS Master's | 606 | 85.8% | 100 | 14.2% | 706 | 139 | 845 | 26 | 35 |
| CS Non-Master's | 834 | 80.4% | 203 | 19.6% | 1,037 | 1 | 1,038 | 83 | 92 |
| CS Taulbee | 12,509 | 84.3% | 2,325 | 15.7% | 14,834 | 422 | 15,256 | | |
| CE Overall | 113 | 93.4% | 8 | 6.6% | 121 | 0 | 121 | 7 | 7 |
| CE Public | 98 | 92.5% | 8 | 7.5% | 106 | 0 | 106 | 5 | 5 |
| CE Private | 15 | 100.0% | 0 | 0.0% | 15 | 0 | 15 | 2 | 2 |
| CE Master's | 94 | 92.2% | 8 | 7.8% | 102 | 0 | 102 | 4 | 4 |
| CE Non-Master's | 19 | 100.0% | 0 | 0.0% | 19 | 0 | 19 | 3 | 3 |
| CE Taulbee | 2,235 | 88.4% | 293 | 11.6% | 2,528 | 70 | 2,598 | | |
| IS Overall | 177 | 83.1% | 36 | 16.9% | 213 | 66 | 279 | 26 | 26 |
| IS Public | 97 | 81.5% | 22 | 18.5% | 119 | 66 | 185 | 8 | 8 |
| IS Private | 80 | 85.1% | 14 | 14.9% | 94 | 0 | 94 | 18 | 18 |
| IS Master's | 48 | 84.2% | 9 | 15.8% | 57 | 66 | 123 | 8 | 8 |
| IS Non-Master's | 129 | 82.7% | 27 | 17.3% | 156 | 0 | 156 | 18 | 18 |
| IT Overall | 209 | 84.3% | 39 | 15.7% | 248 | 81 | 329 | 18 | 21 |
| IT Public | 160 | 87.4% | 23 | 12.6% | 183 | 81 | 264 | 9 | 11 |
| IT Private | 49 | 75.4% | 16 | 24.6% | 65 | 0 | 65 | 9 | 10 |
| IT Master's | 136 | 88.3% | 18 | 11.7% | 154 | 81 | 235 | 8 | 11 |
| IT Non-Master's | 73 | 77.7% | 21 | 22.3% | 94 | 0 | 94 | 10 | 10 |
| SE Overall | 99 | 89.2% | 12 | 10.8% | 111 | 0 | 111 | 8 | 9 |
| SE Public | 56 | 87.5% | 8 | 12.5% | 64 | 0 | 64 | 3 | 4 |
| SE Private | 43 | 91.5% | 4 | 8.5% | 47 | 0 | 47 | 5 | 5 |
| SE Master's | 15 | 78.9% | 4 | 21.1% | 19 | 0 | 19 | 2 | 2 |
| SE Non-Master's | 84 | 91.3% | 8 | 8.7% | 92 | 0 | 92 | 6 | 7 |
| NDC Overall | 2,038 | 83.7% | 398 | 16.3% | 2,436 | 287 | 2,723 | 119 | 190 |
| Taulbee Overall | 17,873 | 83.7% | 3,487 | 16.3% | 21,360 | 520 | 21,880 | | |

TABLE B6. BACHELOR'S DEGREES AWARDED BY ETHNICITY (121 units)

| | US Residents | | | | | | | Others | | | | Total |
|--------------------|---------------------|---|-------|--|--------------------------------|-------|--------------------------------------|------------------|---|--------------------------------------|----------------------|-------|
| | Hispanic/ Latino | American Indian/ Alaska Native | Asian | Native Hawaiian/ Pacific Islander | Black/ African- American | White | 2 or more races, non- Hispanic | Non- Resident | Total Ethnicity, Residency Known | U.S. Residency Race Unknown | Residency Unknown | Total |
| NDC Overall | 183 | 9 | 238 | 9 | 135 | 1,381 | 51 | 124 | 2,130 | 485 | 110 | 2,725 |
| | 8.6% | 0.4% | 11.2% | 0.4% | 6.3% | 64.8% | 2.4% | 5.8% | 100.0% | - | - | - |
| CS | 117 | 5 | 162 | 8 | 86 | 985 | 41 | 98 | 1,502 | 278 | 105 | 1,885 |
| | 7.8% | 0.3% | 10.8% | 0.5% | 5.7% | 65.6% | 2.7% | 6.5% | 100.0% | - | - | - |
| CE | 25 | 1 | 27 | 0 | 2 | 47 | 5 | 9 | 116 | 5 | 0 | 121 |
| | 21.6% | 0.9% | 23.3% | 0.0% | 1.7% | 40.5% | 4.3% | 7.8% | 100.0% | - | - | - |
| IS | 30 | 3 | 25 | 0 | 23 | 109 | 1 | 3 | 194 | 82 | 3 | 279 |
| | 15.5% | 1.5% | 12.9% | 0.0% | 11.9% | 56.2% | 0.5% | 1.5% | 100.0% | - | - | - |
| IT | 9 | 0 | 22 | 0 | 21 | 141 | 2 | 12 | 207 | 120 | 2 | 329 |
| | 4.3% | 0.0% | 10.6% | 0.0% | 10.1% | 68.1% | 1.0% | 5.8% | 100.0% | - | - | - |
| SE | 2 | 0 | 2 | 1 | 3 | 99 | 2 | 2 | 111 | 0 | 0 | 111 |
| | 1.8% | 0.0% | 1.8% | 0.9% | 2.7% | 89.2% | 1.8% | 1.8% | 100.0% | - | - | - |
| Taulbee Overall | 1,414 | 59 | 3,821 | 74 | 803 | 9,513 | 379 | 1,494 | 17,557 | | | |
| | 8.1% | 0.3% | 21.8% | 0.4% | 4.6% | 54.2% | 2.2% | 8.5% | 100.0% | - | - | - |

schools are lower than those reported in the Taulbee survey (11.2% vs. 21.8% and 5.8% vs. 8.5%, respectively).

Changes in mean CS enrollment between 2014-2015 and 2015-2016 broken out by institution type are reported in Table B7. Across all respondents, the mean enrollments increased 5.7% for all institution types. Private institutions experienced higher increases than publics (14.5% vs. 3.0%) and non-master's-granting institutions saw an increased mean enrollment (3.9%) while master's-granting institutions experienced a decrease (-4.0%). For those units responding both years, overall CS enrollment increases were 5.5%. In this group, public and master's-granting institutions experienced increases of 12.4% and 14.5% respectively, while private and non-master's-granting institutions saw decreases of 7.5% and 3.3%, respectively.

Table B8 presents the change in mean bachelor's enrollment and new major enrollment for the last year and breaks those statistics out by discipline. This discussion focuses on those

units responding both years as they provide more reliable and interesting information. The mean enrollment per program increased in computer science (5.5%), information technology (23.4%), and software engineering (2.8%), while decreasing in computer engineering (-2.7%) and information systems (-10.2%). The mean number of new majors rose in information technology (30.9%), while information systems saw the largest decrease (-38.9%). Of note is the decrease of 0.7% new student enrollment in computer science.

The percentage of new majors within total enrollment appears in Table B9 and is broken out by program type. Across all program types, 30.6% of enrollment is comprised of new majors, a slight increase from the 30.0% reported last year. Higher percentages in comparison to last year are reported in computer science (30.4% vs. 29.1%), computer engineering (28.4% vs. 24.8%), and software engineering (38.7% vs. 31.2%), while decreases are reported in information systems (33.2% vs. 40.1%) and information technology (26.1% vs. 30.8%).

TABLE B7. COMPUTER SCIENCE ENROLLMENT CHANGE BY INSTITUTION TYPE

| | All Respondents | | | | | | | Units Responding Both Years | | | | | | |
|--------------|--------------------|-----------|-------------|--------------------|-----------|-------------|------------|-----------------------------|-----------|-------------|-----------|-------------|------------|--|
| | 2014-2015 | | | 2015-2016 | | | | Number of Units | 2014-2015 | | | 2015-2016 | | |
| | Number of Units | Headcount | Mean Enroll | Number of Units | Headcount | Mean Enroll | % Increase | | Headcount | Mean Enroll | Headcount | Mean Enroll | % Increase | |
| NDC Overall | 115 | 13,087 | 113.8 | 106 | 12,752 | 120.3 | 5.7% | 60 | 7,649 | 127.5 | 8,072 | 134.5 | 5.5% | |
| Public | 41 | 8,840 | 215.6 | 37 | 8,216 | 222.1 | 3.0% | 22 | 5,002 | 227.4 | 5,621 | 255.5 | 12.4% | |
| Private | 74 | 4,247 | 57.4 | 69 | 4,536 | 65.7 | 14.5% | 38 | 2,647 | 69.7 | 2,451 | 64.5 | -7.5% | |
| Master's | 23 | 5,995 | 260.7 | 25 | 6,260 | 250.4 | -4.0% | 12 | 3,777 | 314.8 | 4,326 | 360.5 | 14.5% | |
| Non-Master's | 92 | 7,092 | 77.1 | 81 | 6,492 | 80.1 | 3.9% | 48 | 3,872 | 80.7 | 3,746 | 78 | -3.3% | |
| Taulbee | 139* | 80,442 | 578.7 | NA** | NA** | NA** | NA** | NA** | NA** | NA** | NA** | NA** | NA** | |

*Note: Number of units responding to Taulbee.

**Note: Taulbee enrollment data is reported for previous year and for all respondents only

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TABLE B8. ACTUAL ENROLLMENT CHANGE FROM PREVIOUS YEAR BY DISCIPLINE

| | All Respondents | | | Units Responding Both Years | | |
|------------------------|-----------------|-----------|------------------------------|-----------------------------|-----------|------------------------------|
| | 2014-2015 | 2015-2016 | % Change in Mean per Program | 2014-2015 | 2015-2016 | % Change in Mean per Program |
| All Disciplines | | | | | | |
| # departments | 130 | 114 | NA | 63 | 63 | 0.0% |
| # programs | 212 | 185 | NA | 109 | 109 | 0.9% |
| BS enrollment | 17,789 | 18,581 | 19.7% | 10,254 | 10,935 | 6.6% |
| New BS majors | 5,092 | 5,382 | 21.1% | 2,832 | 2,816 | -0.6% |
| CS | | | | | | |
| # departments | 115 | 106 | NA | 60 | 60 | 0.0% |
| # programs | 135 | 124 | NA | 73 | 73 | 0.0% |
| BS enrollment | 13,087 | 12,752 | 6.1% | 7,649 | 8,072 | 5.5% |
| New BS majors | 3,665 | 3,629 | 7.8% | 2,146 | 2,131 | -0.7% |
| CE | | | | | | |
| # departments | 7 | 6 | NA | 4 | 4 | 0.0% |
| # programs | 7 | 7 | NA | 4 | 4 | 0.0% |
| BS enrollment | 592 | 849 | 43.4% | 482 | 469 | -2.7% |
| New BS majors | 147 | 281 | 91.2% | 125 | 121 | -3.2% |
| IS | | | | | | |
| # departments | 35 | 25 | NA | 16 | 16 | 0.0% |
| # programs | 38 | 25 | NA | 16 | 16 | 0.0% |
| BS enrollment | 1,236 | 1,514 | 86.2% | 413 | 371 | -10.2% |
| New BS majors | 425 | 483 | 72.7% | 113 | 69 | -38.9% |
| IT | | | | | | |
| # departments | 17 | 17 | NA | 9 | 9 | 0.0% |
| # programs | 20 | 20 | NA | 9 | 9 | 0.0% |
| BS enrollment | 2,192 | 2,124 | -3.1% | 1,287 | 1,588 | 23.4% |
| New BS majors | 642 | 527 | -17.9% | 307 | 402 | 30.9% |
| SE | | | | | | |
| # departments | 11 | 8 | NA | 6 | 6 | 0.0% |
| # programs | 12 | 9 | NA | 7 | 7 | 0.0% |
| BS enrollment | 682 | 1,342 | 162.4% | 423 | 435 | 2.8% |
| New BS majors | 213 | 462 | 189.2% | 141 | 93 | -34.0% |

MASTER'S DEGREE PRODUCTION AND ENROLLMENTS

In 2015-16, 28 distinct academic units reported on a total of 40 master's programs in computing, down from last year's 33 units and 43 programs, respectively. Of the 28, 19 were public and nine private (Tables M1-M2). They accounted for 24 programs in computer science, two in computer engineering, five in information systems, four in information technology, and five in software engineering. The small number of participating academic units, students and programs, especially when considered on a discipline-specific basis, should be taken into account when drawing any conclusions from the data presented here. Furthermore, the low sample of units that provided master's degree data to the survey this year and last (12 units reporting on 18 programs in 2015-16, across all of the disciplines) precludes our drawing broad conclusions across multiple years.

Table M3 shows actual degree production in 2014-2015 and anticipated change in that production for 2015-2016 broken down by institution type. Those institutions responding to this year's survey anticipate an overall 7.3% increase in the production of master's degrees in 2015-2016 over those granted in 2014-2015 (Table M3). CS programs anticipate a 3.8% increase.

Among the 2014-15 master's degree graduates, 26.3% were female, lower than the 29.3% at Taulbee schools in 2014-15, and lower than the 31.3% reported by NDC schools last year for 2013-14 graduates (Table M4). CS, the discipline with the largest response size, reported 26.6% female graduates, slightly higher than the 24.9% reported by Taulbee CS master's programs, but lower than the 30.6% reported by NDC CS master's programs last year. Taulbee's "I" programs reported that 48% of their master's degrees went to females compared to 27.5% of IS and IT master's degrees at NDC programs.

TABLE B9. 2015–2016 BACHELOR'S ENROLLMENTS BY DISCIPLINE AND PROGRAM TYPE

| | Majors | New Majors | # Programs Reporting Majors | # Programs Reporting New Majors | Avg. Majors per Program | Avg. New Majors per Program | Avg. % New Majors per Program |
|-----------------|--------|------------|-----------------------------|---------------------------------|-------------------------|-----------------------------|-------------------------------|
| CS Overall | 12,752 | 3,629 | 124 | 116 | 102.8 | 31.3 | 30.4% |
| CS Public | 8,216 | 2,110 | 40 | 35 | 205.4 | 60.3 | 29.4% |
| CS Private | 4,536 | 1,519 | 84 | 81 | 54 | 18.8 | 34.7% |
| CS Master's | 6,260 | 1,612 | 34 | 29 | 184.1 | 55.6 | 30.2% |
| CS Non-Master's | 6,492 | 2,017 | 90 | 87 | 72.1 | 23.2 | 32.2% |
| CE Overall | 849 | 281 | 6 | 7 | 141.5 | 40.1 | 28.4% |
| CE Public | 792 | 257 | 4 | 5 | 198 | 51.4 | 26.0% |
| CE Private | 57 | 24 | 2 | 2 | 28.5 | 12.0 | 42.1% |
| CE Master's | 745 | 236 | 4 | 4 | 186.3 | 59.0 | 31.7% |
| CE Non-Master's | 104 | 45 | 2 | 3 | 52 | 15.0 | 28.8% |
| IS Overall | 1,514 | 483 | 25 | 24 | 60.6 | 20.1 | 33.2% |
| IS Public | 1,210 | 425 | 7 | 6 | 172.9 | 70.8 | 41.0% |
| IS Private | 304 | 58 | 18 | 18 | 16.9 | 3.2 | 19.1% |
| IS Master's | 641 | 137 | 8 | 7 | 80.1 | 19.6 | 24.4% |
| IS Non-Master's | 873 | 346 | 17 | 17 | 51.4 | 20.4 | 39.6% |
| IT Overall | 2,124 | 527 | 20 | 19 | 106.2 | 27.7 | 26.1% |
| IT Public | 1,086 | 234 | 10 | 9 | 108.6 | 26.0 | 23.9% |
| IT Private | 1,038 | 293 | 10 | 10 | 103.8 | 29.3 | 28.2% |
| IT Master's | 1,086 | 209 | 10 | 9 | 108.6 | 23.2 | 21.4% |
| IT Non-Master's | 1,038 | 318 | 10 | 10 | 103.8 | 31.8 | 30.6% |
| SE Overall | 1,342 | 462 | 9 | 8 | 149.1 | 57.8 | 38.7% |
| SE Public | 365 | 77 | 4 | 3 | 91.3 | 25.7 | 28.1% |
| SE Private | 977 | 385 | 5 | 5 | 195.4 | 77.0 | 39.4% |
| SE Master's | 128 | 19 | 2 | 1 | 64 | 19.0 | 29.7% |
| SE Non-Master's | 1,214 | 443 | 7 | 7 | 173.4 | 63.3 | 36.5% |
| NDC Overall | 18,581 | 5,382 | 184 | 174 | 101 | 30.9 | 30.6% |
| Taulbee | NA* | 30,147 | NA** | 144 | NA** | 209.4 | NA** |

*Note: Taulbee does not report total enrollment for current year

**Note: Taulbee only reports by department, not by program

A comparison of ethnicity data between NDC and Taulbee schools (Table M5) shows that NDC schools had a higher percentage of Hispanic/Latino US resident graduates (5% vs. 2.3%), black/African American resident graduates (2.8% vs. 2.3%), Asian (23.9% vs. 10.2%), and graduates of two or more races (1.8% vs. 0.6%). The percentage of white graduates was nearly the same (22.1% in NDC vs. 22.7% in Taulbee). There was a much smaller percentage of non-resident graduates at NDC institutions than at Taulbee (44.4% vs. 61.4%). With the exception of whites, which last year had a higher percentage for NDC respondents than for Taulbee respondents, the direction of these comparisons mirror those reported last year. It's useful to note that only 9.5% of total Taulbee master's graduates were marked as residents of unknown ethnicity or students of unknown residency. For NDC, the number is 53.6%, which may once again suggest that gathering ethnicity/residency data is a challenge at NDC programs—this year's gap is more than twice the one observed last year.

This year's NDC percentages are higher than those from last year for Asians (23.9% vs. 14.1%) and non-residents (44.4% vs. 31.4%). They are lower for Hispanic/Latino (5.0% vs. 6.8%), black/African American (2.8% vs. 8.3%), and white (22.1% vs. 34.7%).

Overall enrollment at NDC master's programs reporting this year was 3,750, which represents a 15.3% increase from the mean enrollment per program reported by last year's respondents (Table M6). The table shows that the same number of programs reported each year, but the specific programs that reported are not identical. When only those programs that responded both years are considered, the overall enrollment increase is 59.0% across all disciplines, with CS programs showing a 59.4% increase. Again, the data is based on a small sample size of only 11 CS programs and 18 programs overall.

FACULTY DEMOGRAPHICS

The average number of faculty for this year's responding academic units was 12.3, with an average 9.9 FTE (Table F1). Each

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TABLE M1. BREAKDOWN OF ACADEMIC UNITS RESPONDING TO MASTER'S SECTION OF SURVEY

| | Number of Units | % of Total Responses |
|---------------------------------|-----------------|----------------------|
| Public | 19 | 67.9% |
| Private | 9 | 32.1% |
| Total Units Proving Data | 28 | |

TABLE M2. SUMMARY OF PROGRAM OFFERINGS

| | Overall | | | Public | | Private | |
|---------------|-----------------|--------------------|------------|--------------------|------------|--------------------|------------|
| | Number of Units | Number of Programs | % of Total | Number of Programs | % of Total | Number of Programs | % of Total |
| CS | 23 | 24 | 60.0% | 17 | 65.4% | 7 | 50.0% |
| CE | 2 | 2 | 5.0% | 2 | 7.7% | 0 | 0.0% |
| IS | 5 | 5 | 12.5% | 4 | 15.4% | 1 | 7.1% |
| IT | 3 | 4 | 10.0% | 1 | 3.8% | 3 | 21.4% |
| SE | 5 | 5 | 12.5% | 2 | 7.7% | 3 | 21.4% |
| Totals | 28 | 40 | | 26 | | 14 | |

TABLE M3. DEGREE PRODUCTION AND ANTICIPATED CHANGE BY DISCIPLINE

| | 2014-2015 | | | | 2015-2016 | | | | % change |
|-------------|-----------------|--------------------|--------|-------------|-----------------|--------------------|-----------|-------------|----------|
| | Number of Units | Number of Programs | Actual | Per Program | Number of Units | Number of Programs | Projected | Per Program | |
| NDC Overall | 22 | 34 | 1,303 | 38.3 | 24 | 34 | 1,399 | 41.1 | 7.3% |
| CS | 21 | 22 | 1,091 | 49.6 | 21 | 22 | 1,134 | 51.5 | 3.8% |
| CE | 2 | 2 | 11 | 5.5 | 2 | 2 | 25 | 12.5 | 127.3% |
| IS | 4 | 4 | 81 | 20.3 | 4 | 4 | 121 | 30.3 | 49.3% |
| IT | 2 | 2 | 17 | 8.5 | 2 | 2 | 20 | 10 | 17.6% |
| SE | 4 | 4 | 103 | 25.8 | 4 | 4 | 99 | 24.8 | -3.9% |

TABLE M4. MASTER'S DEGREES AWARDED BY GENDER, DISCIPLINE, AND INSTITUTION TYPE

| | Male | | Female | | Total Known Gender | Gender Unknown | Grand Total | Number of Units | Number of Programs |
|-----------------|-------|-------|--------|-------|--------------------|----------------|-------------|-----------------|--------------------|
| CS Overall | 793 | 73.4% | 287 | 26.6% | 1,080 | 14 | 1,094 | 22 | 23 |
| CS Public | 730 | 74.5% | 250 | 25.5% | 980 | 8 | 988 | 15 | 16 |
| CS Private | 63 | 63.0% | 37 | 37.0% | 100 | 6 | 106 | 7 | 7 |
| CS Taulbee | 7,268 | 75.1% | 2,404 | 24.9% | 9,672 | 261 | 9,933 | N/A | N/A |
| CE Overall | 7 | 63.6% | 4 | 36.4% | 11 | 0 | 11 | 2 | 2 |
| CE Public | 7 | 63.6% | 4 | 36.4% | 11 | 0 | 11 | 2 | 2 |
| CE Private | 0 | 0.0% | 0 | 0.0% | 0 | 0 | 0 | 0 | 0 |
| CE Taulbee | 467 | 76.1% | 147 | 23.9% | 614 | 0 | 614 | N/A | N/A |
| IS Overall | 39 | 75.0% | 13 | 25.0% | 52 | 29 | 81 | 4 | 4 |
| IS Public | 22 | 75.9% | 7 | 24.1% | 29 | 29 | 58 | 3 | 3 |
| IS Private | 17 | 73.9% | 6 | 26.1% | 23 | 0 | 23 | 1 | 1* |
| IT Overall | 11 | 64.7% | 6 | 35.3% | 17 | 0 | 17 | 2 | 2* |
| IT Public | 11 | 64.7% | 6 | 35.3% | 17 | 0 | 17 | 1 | 1* |
| IT Private | 0 | 0.0% | 0 | 0.0% | 0 | 0 | 0 | 1 | 1* |
| "I" Taulbee | 1,294 | 52.0% | 1,194 | 48.0% | 2,488 | 0 | 2,488 | N/A | N/A |
| SE Overall | 96 | 78.0% | 27 | 22.0% | 123 | 0 | 123 | 5 | 5 |
| SE Public | 82 | 83.7% | 16 | 16.3% | 98 | 0 | 98 | 2 | 2 |
| SE Private | 14 | 56.0% | 11 | 44.0% | 25 | 0 | 25 | 3 | 3 |
| NDC Overall | 946 | 73.7% | 337 | 26.3% | 1,283 | 43 | 1,326 | 25 | 36 |
| Taulbee Overall | 9,029 | 70.7% | 3,745 | 29.3% | 12,774 | 261 | 13,035 | 166 | N/A |

*Program categories where only 1 program provided data. No conclusions should be drawn due to very small sample.

TABLE M5. MASTER'S DEGREES AWARDED BY ETHNICITY (28 units)

| | US Residents | | | | | | | Others | | | | Total |
|-----------------|-----------------|-------------------------------|-------|----------------------------------|------------------------|-------|-------------------------------|--------------|----------------------------------|-----------------------------|-------------------|--------|
| | Hispanic/Latino | American Indian/Alaska Native | Asian | Native Hawaiian/Pacific Islander | Black/African-American | White | 2 or more races, non-Hispanic | Non-Resident | Total Ethnicity, Residency Known | U.S. Residency Race Unknown | Residency Unknown | Total |
| NDC Overall | 31 | 0 | 147 | 0 | 17 | 136 | 11 | 273 | 615 | 70 | 641 | 1,326 |
| | 5.0% | 0.0% | 23.9% | 0.0% | 2.8% | 22.1% | 1.8% | 44.4% | 100.0% | | | |
| Taulbee Overall | 266 | 62 | 1,206 | 6 | 270 | 2,675 | 72 | 7,237 | 11,794 | 459 | 782 | 13,035 |
| | 2.3% | 0.5% | 10.2% | 0.1% | 2.3% | 22.7% | 0.6% | 61.4% | 100.0% | | | |

TABLE M6. ACTUAL ENROLLMENT CHANGE FROM PREVIOUS YEAR BY DISCIPLINE

| | All Respondents | | | | | | | | | Units Responding Both Years | | | | | | | | |
|-------------|-----------------|--------------------|-----------|-------------|-----------------|--------------------|-----------|-------------|------------------------------|-----------------------------|--------------------|-----------|-------------|-----------------|--------------------|-----------|-------------|------------------------------|
| | 2014-2015 | | | | 2015-2016 | | | | | 2014-2015 | | | | 2015-2016 | | | | |
| | Number of Units | Number of Programs | Headcount | Mean Enroll | Number of Units | Number of Programs | Headcount | Mean Enroll | % Change in Mean per Program | Number of Units | Number of Programs | Headcount | Mean Enroll | Number of Units | Number of Programs | Headcount | Mean Enroll | % Change in Mean per Program |
| CS | 20 | 21 | 2,141 | 102.0 | 22 | 23 | 3,024 | 131.5 | 28.9% | 11 | 11 | 1,729 | 157.2 | 11 | 11 | 2,755 | 250.5 | 59.4% |
| CE | 2 | 2 | 65 | 32.5 | 2 | 2 | 216 | 108 | 232.3% | 1 | 1 | 40 | 40 | 1 | 1 | 35 | 35 | -12.5% |
| IS | 4 | 4 | 142 | 35.5 | 5 | 5 | 218 | 43.6 | 2.1% | 2 | 2 | 36 | 18 | 2 | 2 | 48 | 24 | 33.3% |
| IT | 5 | 5 | 673 | 134.6 | 2 | 2 | 87 | 43.5 | -67.8% | 1 | 1 | 60 | 60 | 1 | 1 | 70 | 70 | 16.7% |
| SE | 5 | 5 | 232 | 46.4 | 5 | 5 | 205 | 41 | -11.7% | 3 | 3 | 167 | 55.7 | 3 | 3 | 154 | 51.3 | -7.9% |
| NDC Overall | 28 | 37 | 3,253 | 87.9 | 26 | 37 | 3,750 | 101.4 | 15.3% | 12 | 18 | 2,046 | 113.7 | 12 | 18 | 3,252 | 180.7 | 59.0% |

of these values is higher than last year's (10.2 and 8.1, respectively). It is not surprising to see growth in faculty size given the higher demands on units due to undergraduate enrollment increases. But it is interesting to see just where the units grew.

The average number of tenure-track faculty per unit increased to 5.3 (5.2 FTE) from 4.9 (4.8 FTE) last year, and the average number of part-time/adjunct faculty increased to 5.6 (3.4 FTE) from 4.2 (2.1 FTE) last year. Among the institutions responding, however, tenure-track faculty now are just 52.5% of the total faculty FTE compared with 59.9% last year, while part-time/adjunct faculty comprise 34.0% of the total FTE compared to 26.1% last year. The differences between public and private university distributions of faculty are similar to those observed last year, with publics having slightly higher percentages of tenure-track and full-time non-tenure-track faculty, and smaller percentages of visiting and part-time/adjunct faculty on average than their private university counterparts. This year, 44.3%

of the faculty in those institutions having master's programs were part-time/adjunct. This is much larger than the 27.0% reported last year. Conversely, the percentage of tenure-track faculty in institutions with master's programs dropped from 56.3% to 42.0%. Institutions with only undergraduate programs did not experience very much change in the distribution of faculty members compared with last year.

The overall distribution of tenure-track faculty is fairly even across ranks. This year, there is a somewhat greater percentage of assistant professors and a smaller percentage of full professors at public universities than there was last year, and there is a greater percentage of associate professors and a smaller percentage of full professors at institutions with master's programs than there was last year (Table F2).

There is somewhat greater gender diversity in tenure-track faculty this year than there was last year (Table F3), with the percentage of female faculty rising from 24.4% last year to 26.2% this year.

TABLE F1. ACTUAL FACULTY SIZE 2015-2016

| Faculty Type | Overall Avg HC | Overall % of HC Total | Overall Avg FTE | Overall % of FTE Total | Public FTE | Private FTE | UG Only FTE | UG+ grad FTE |
|---------------|----------------|-----------------------|-----------------|------------------------|------------|-------------|-------------|--------------|
| # respondents | 131 | | 131 | | 48 | 83 | 97 | 32 |
| Tenure-track | 5.3 | 43.2% | 5.2 | 52.5% | 55.2% | 50.0% | 64.5% | 42.0% |
| Visiting | 0.3 | 2.6% | 0.3 | 2.9% | 1.7% | 4.1% | 5.1% | 1.1% |
| FT Non-TT | 1.1 | 8.6% | 1 | 10.5% | 13.9% | 7.3% | 8.2% | 12.6% |
| PT/Adjunct | 5.6 | 45.6% | 3.4 | 34.0% | 29.2% | 38.7% | 22.2% | 44.3% |
| Total | 12.3 | | 9.9 | | | | | |

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TABLE F2. TENURE-TRACK FACULTY AVERAGE HEADCOUNT BREAKDOWN BY RANK

| Faculty Type | Overall | Overall % | Public | Private | UG Only | UG+grad |
|---------------------|---------|-----------|--------|---------|---------|---------|
| # respondents | 125 | | 46 | 79 | 95 | 28 |
| Full Professor | 1.9 | 36.9% | 34.6% | 39.2% | 37.7% | 35.4% |
| Associate Professor | 1.9 | 35.7% | 35.8% | 35.6% | 33.7% | 38.7% |
| Assistant Professor | 1.4 | 26.9% | 28.7% | 25.1% | 28.1% | 25.5% |
| Other | 0 | 0.5% | 0.9% | 0.0% | 0.5% | 0.4% |

TABLE F3. TENURE-TRACK FACULTY HEADCOUNT BREAKDOWN BY GENDER (131 units)

| Gender | Full Prof | Assoc Prof | Asst Prof | Other T-T | Total T-T |
|-----------------|-----------|------------|-----------|-----------|-----------|
| Total Faculty | 260 | 246 | 186 | 3 | 695 |
| Male | 78.5% | 72.4% | 67.2% | 0.0% | 72.9% |
| Female | 21.2% | 27.2% | 31.7% | 33.3% | 26.2% |
| Not Reported | 0.4% | 0.4% | 1.1% | 66.7% | 0.9% |
| Percent Female* | 21.2% | 27.3% | 32.1% | 100.0% | 26.4% |

* as a percentage of those for whom gender was reported

TABLE F4. TENURE-TRACK FACULTY HEADCOUNT BREAKDOWN BY ETHNICITY (131 units)

| Ethnicity | Full Prof | Assoc Prof | Asst Prof | Other T-T | Total T-T |
|--|-----------|------------|-----------|-----------|-----------|
| Total faculty | 260 | 246 | 188 | 3 | 697 |
| Nonresident Alien | 1.5% | 0.8% | 5.9% | 0.0% | 2.4% |
| American Indian/ Alaska Native | 1.9% | 0.0% | 2.1% | 0.0% | 1.3% |
| Asian | 18.5% | 25.2% | 20.2% | 0.0% | 21.2% |
| Black or African-American | 0.8% | 4.1% | 1.6% | 0.0% | 2.2% |
| Native Hawaiian/ Pacific Islander | 0.4% | 0.8% | 0.5% | 0.0% | 0.6% |
| White | 71.2% | 61.8% | 62.8% | 33.3% | 65.4% |
| Multiracial, not Hispanic/Latino | 0.0% | 0.4% | 0.0% | 0.0% | 0.1% |
| Hispanic/Latino, any race | 1.2% | 1.2% | 3.2% | 0.0% | 1.7% |
| Resident, race/ ethnicity unknown | 2.3% | 1.2% | 0.0% | 0.0% | 1.3% |
| Total Residency known | 97.7% | 95.5% | 96.3% | 33.3% | 96.3% |
| Residency unknown | 2.3% | 4.5% | 3.7% | 66.7% | 3.7% |
| Black+Hisp+ NatAm+ NatHaw+Multi* | 4.3% | 6.8% | 7.7% | 0.0% | 6.1% |

* as a percentage of those for whom gender was reported

Increased diversity was most notable at the full professor rank (21.2% compared with 17.9% last year). Ethnic diversity in tenure-track faculty appears to be somewhat less, by contrast. This year, the total percentage of tenure-track faculty who are black/African American, Hispanic, Native American, Native Hawaiian/Pacific Islander, or multiracial, as a percentage for whom residency is known, dropped to 6.1% from 8.3% last year. Reductions in

TABLE F5. FACULTY RECRUITING DURING 2014-2015 (61 units)

| Faculty Type | Number Sought | Avg/Dept | Number Filled | Success Rate |
|---------------------|---------------|----------|---------------|--------------|
| Tenure-track | 60 | 0.98 | 47 | 78.3% |
| Full Professor | | | 4 | |
| Associate Professor | | | 1 | |
| Assistant Professor | | | 41 | |
| Other | | | 1 | |
| Visiting | 21 | 0.34 | 18 | 85.7% |
| FT Non-TT | 31 | 0.51 | 27 | 87.1% |
| PT/Adjunct | 128 | 2.1 | 128 | 100.0% |

this percentage were present at all faculty ranks (Table F4).

Of the 60 tenure-track faculty members sought by this year's respondents, 47 hires were made for a success rate of 78.3% (Table F5). This compares with last year's 90.9% success rate. Women comprised 27.7% of the new hires (about the same percentage of total tenure-track faculty reported earlier, but less than the 33.9% of new hires reported last year). There was slightly greater ethnic diversity, 13.0% of those new hires for whom residency is known are black/African American, Hispanic, Native American, Native Hawaiian/Pacific Islander, or multiracial, as compared with 8.9% last year. But the small number of total hires in these categories, both individually and collectively, makes it inappropriate to draw any conclusions from these data (Table F6).

Table F7 shows the degree required for hiring and promotion of faculty at different ranks. As one would expect, these data do not change much from year to year.

This year, respondents reported only departures for 31 faculty members, as compared with 67 departures reported last year. The distribution of these departures is shown in Table F8. Due to the relatively small number of departures this year, no comparison is being made relative to the distribution.

FACULTY SALARIES

Academic units were given the option to report faculty salaries by individual faculty member (anonymized) or simply an aggregated median salary for each faculty rank. For the second year in a row, there was a smaller percentage of units that provided individual salary data (38% vs. 46% last year). Table F9 shows

TABLE F6. GENDER AND ETHNICITY OF NEWLY HIRED FACULTY (61 units)

| Gender | Tenure-Track | % of Total |
|----------------------------------|--------------|------------|
| Male | 34 | 72.3% |
| Female | 13 | 27.7% |
| Unknown | 0 | 0.0% |
| Ethnicity | Tenure-Track | % of Total |
| Nonresident Alien | 5 | 10.6% |
| American Indian/Alaska Native | 0 | 0.0% |
| Asian | 10 | 21.3% |
| Black or African-American | 1 | 2.1% |
| Native Hawaiian/Pacific Islander | 1 | 2.1% |
| White | 24 | 51.1% |
| Multiracial, not Hispanic/Latino | 1 | 2.1% |
| Hispanic/Latino, any race | 3 | 6.4% |
| Resident, race/ethnicity unknown | 1 | 2.1% |
| Total Residency known | 46 | 97.9% |
| Residency unknown | 1 | 2.1% |
| Black+Hisp+NatAm+NatHaw+Multi | 6 | 13.0% |

the median salaries at each rank for those faculty from units that reported individual salaries. These values are true medians at each rank of the faculty at these 27 units. Because the number of individual salaries reported at each rank is much less than it was last year, we will not make comparisons between these values and the corresponding values last year. Table F9

TABLE F8. TENURE-TRACK FACULTY DEPARTURES (77 units)

| | NDC |
|--|-------|
| Responding departments with departures | 26 |
| Total number of departures | 31 |
| Reason for Departure (percent) | |
| Retired | 41.9% |
| Deceased | 6.5% |
| Other ac position | 12.9% |
| Non-ac position | 19.4% |
| Changed to PT | 0.0% |
| Other reason | 9.7% |
| Reason unknown | 9.7% |

does indicate that, at all ranks, the median salaries are higher at institutions having graduate programs than they are at institutions having only undergraduate programs.

Table F10 has the corresponding faculty salary information for all units that reported salary data. This includes those units that reported aggregated salaries at each rank; it also includes those that reported individual salaries, as we are able to compute the median salary at each rank for each such academic unit. The entries in Table F10 are the averages of the median salaries among those academic units that reported salary data at a given rank. They are not true medians of all faculty salaries nor true averages of all faculty salaries, and are more sensitive to a very high or very low salary in a unit with a small num-

TABLE F7. DEGREE REQUIRED FOR FACULTY PERSONNEL DECISIONS

| Required Degree | Hiring Full Prof | Hiring Assoc Prof | Hiring Asst Prof | Hiring FT Non-TT | Tenure | Promotion to Full Prof | Promotion to Assoc Prof |
|-----------------------------|------------------|-------------------|------------------|------------------|--------|------------------------|-------------------------|
| Overall (126) | | | | | | | |
| Doctoral | 93.4% | 91.7% | 78.9% | 13.0% | 87.6% | 94.4% | 91.1% |
| Masters | 6.6% | 8.3% | 21.1% | 84.6% | 12.4% | 5.6% | 8.9% |
| Bachelors | 0.0% | 0.0% | 0.0% | 2.4% | 0.0% | 0.0% | 0.0% |
| Public (45) | | | | | | | |
| Doctoral | 97.7% | 95.2% | 93.0% | 9.1% | 95.3% | 97.7% | 95.3% |
| Masters | 2.3% | 4.8% | 7.0% | 90.9% | 4.7% | 2.3% | 4.7% |
| Bachelors | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Private (81) | | | | | | | |
| Doctoral | 91.1% | 89.9% | 71.3% | 15.2% | 83.3% | 92.6% | 88.9% |
| Masters | 8.9% | 10.1% | 28.7% | 81.0% | 16.7% | 7.4% | 11.1% |
| Bachelors | 0.0% | 0.0% | 0.0% | 3.8% | 0.0% | 0.0% | 0.0% |
| UG only (96) | | | | | | | |
| Doctoral | 92.6% | 90.4% | 74.0% | 13.8% | 85.1% | 93.8% | 89.6% |
| Masters | 7.4% | 9.6% | 26.0% | 83.0% | 14.9% | 6.3% | 10.4% |
| Bachelors | 0.0% | 0.0% | 0.0% | 3.2% | 0.0% | 0.0% | 0.0% |
| UG and Master's (28) | | | | | | | |
| Doctoral | 96.2% | 96.0% | 96.0% | 11.1% | 96.0% | 96.2% | 96.2% |
| Masters | 3.8% | 4.0% | 4.0% | 88.9% | 4.0% | 3.8% | 3.8% |
| Bachelors | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |

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TABLE F9. MEDIAN FACULTY SALARIES (FROM INDIVIDUAL SALARY DATA)

| | Overall | Public | Private | UG Only | UG+grad |
|------------------------------|---------|---------|---------|---------|---------|
| Units responding | 27 | 13 | 14 | 22 | 4 |
| Full Professor | | | | | |
| Number of individual faculty | 41 | 25 | 16 | 26 | 14 |
| Median Salary | 106,969 | 110,766 | 98,239 | 100,683 | 119,740 |
| Associate Professor | | | | | |
| Number of individual faculty | 48 | 27 | 21 | 36 | 12 |
| Median Salary | 90,111 | 90,853 | 88,681 | 82,622 | 97,604 |
| Assistant Professor | | | | | |
| Number of individual faculty | 33 | 22 | 11 | 26 | 7 |
| Median Salary | 75,000 | 73,951 | 79,780 | 72,701 | 75,959 |
| Other | | | | | |
| Number of individual faculty | 21 | 18 | 3 | 12 | 9 |
| Median Salary | 56,137 | 56,273 | 56,137 | 56,069 | 56,545 |

TABLE F10. FACULTY SALARIES (FROM AGGREGATE SALARY DATA)

| | Overall | Public | Private | UG Only | UG+grad |
|----------------------------|---------|---------|---------|---------|---------|
| Departments responding | 72 | 30 | 42 | 52 | 18 |
| Full Professor | | | | | |
| Departments responding | 54 | 25 | 29 | 35 | 17 |
| Average of Median Salary | 103,180 | 106,381 | 100,513 | 99,577 | 113,636 |
| Associate Professor | | | | | |
| Departments responding | 59 | 26 | 33 | 42 | 16 |
| Average of Median Salary | 85,723 | 87,908 | 83,988 | 81,253 | 97,749 |
| Assistant Professor | | | | | |
| Departments responding | 50 | 26 | 24 | 34 | 16 |
| Average of Median Salary | 72,590 | 78,555 | 66,845 | 68,251 | 82,624 |
| Other | | | | | |
| Departments responding | 30 | 19 | 11 | 16 | 14 |
| Average of Median Salary | 50,312 | 55,743 | 43,524 | 44,487 | 59,466 |

ber of faculty at a given rank. For this reason, we do not make comparisons of this year's values with those from last year. As with the individual salaries, we see higher values at all ranks for those institutions that have graduate programs as compared with those having only undergraduate programs. We also see higher values at units in public universities than at units in private universities. This is similar to what was observed last year.

CONCLUSION

The NDC data provide further evidence of the widespread increased interest in bachelor's level computer science programs, suggest increased interest in master's level CS programs and increased use of part-time adjunct faculty to meet enrollment demands, and illustrate that there are differences in enrollment patterns in other areas of computing. The healthy increase of more than 17% in CS bachelor's degrees granted is the result of previous years of enrollment growth, and the forecast is for

next year to provide another healthy increase in degree production. This year, however, CS experienced no additional increase in new bachelor's majors, contrary to what is being observed in the doctoral-granting institutions. Of course, sustaining the current high level of new majors is enough to continue taxing programs. But it will be interesting to see if the NDC CS programs are about to reach a high-water mark for total bachelor's majors.

If your program participated in the 2015-2016 ACM-NDC study, thank you for your help. We are considering doing the data collection for the 2016-2017 survey in fall of 2016. This will put the NDC and Taulbee surveys on a similar time schedule. Watch for more information in fall of 2016. We would love to hear from you about how the survey can be improved, and look forward to your continued, annual participation. If you are at a qualifying program but were not able to participate, or were never contacted, we want to hear from you as well. Please send all comments and queries to Yan Timanovsky, ACM Education Manager at yan.timanovsky@acm.org.

LIST OF 2015-2016 ACM-NDC PARTICIPATING ACADEMIC UNITS¹

Abilene Christian University; Albion College; Albright College; Amherst College; Azusa Pacific University; Baldwin-Wallace University; Baylor University; Bennett College for Women; Bennington College Computer Science Program; Blackburn College; Bloomsburg University of Pennsylvania; Boston College Computer Science Department; Brigham Young University-Idaho Department of Computer Information Technology; Brigham Young University-Idaho Department of Computer Science and Electrical Engineering; Butler University Department of Computer Science and Software Engineering; Cabrini College; California State University, Fullerton Department of Computer Science; Calvin College Department of Computer Science; Carleton College; Carnegie Mellon University Software Engineering Masters Programs; Central College; Central Connecticut State University Department Of Computer Science; Centre College; Champlain College Information Assurance & Technology Programs; City University of Seattle Technology Institute; Colby College; Colgate University; College of Engineering, California State University, Long Beach; College of New Jersey Computer Science Department; College of Saint Benedict and Saint John's University; College of the Holy Cross; Columbia College; Columbus State University; Concordia University Texas; Covenant College; Creighton University; Davenport University; Delaware State University Department of Computer & Information Sciences; DePauw University; Dickinson College; Earlham College; East Carolina University Department of Computer Science; East Stroudsburg University of Pennsylvania; Eastern Mennonite University; Eastern Michigan University Computer Science Department; Eckerd College; Elizabethtown College; Eureka College; Georgia College & State University; Georgia Regents University Computer and Information Sciences; Gettysburg College; Gordon College; Graceland University-Lamoni; Grinnell College; Hamilton College; Henderson State University; Hendrix College; Hiram College; Huntington University; Huston-Tillotson University; Illinois State University; Illinois Wesleyan University; Indiana University of Pennsylvania Department of Information Systems and Decision Sciences; Indiana Wesleyan University Division of Mathematics and Computer Information Sciences; Iona College; Juniata College; Kalamazoo College; Kean University; King's College Department of Mathematics and Computer Science; Knox College; Lafayette College Department of Computer Science; Lake Superior State University School of Mathematics & Computer Science; Le Moyne College; LeTourneau University; Longwood University; Loyola University Maryland Department of Computer Science; Manhattan College Department of Computer Science; Marquette University Mathematics, Statistics and Computer Science Department; Maryville College; Metropolitan State University; Metropolitan State University of Denver Department of Mathematical and Computer Sciences; Miami University Computer Science and Software Engineering Department; Middlebury College Department of Computer Science; Millersville University of Pennsylvania; Millikin University; Minnesota State University, Mankato Computer Science Department; Missouri State University Department of Computer Science; Mount Holyoke College; New College of Florida Computer Science Program; Northern Kentucky University; Northwest Missouri State University; Oberlin College; Oklahoma Panhandle State University; Olivet Nazarene University; Otterbein University; Ouachita Baptist University; Our Lady of the Lake University-San Antonio; Park University; Pennsylvania State University-Penn State Dubois; Ramapo College of New Jersey; Regis University College of Computer & Information Sciences; Roanoke College; Roger Williams University; Rose-Hulman

Institute of Technology Department of Computer Science and Software Engineering; Saint Thomas Aquinas College; Sam Houston State University; San Francisco State University Information Systems Department; Schreiner University; Seattle University; Siena College; Simpson College; Southern Connecticut State University; Southwestern University; St. Olaf College; Stephen F. Austin State University; SUNY College at Oswego; SUNY Institute of Technology at Utica-Rome Electrical & Computer Engineering Program; Trinity University; Union College (NY) Computer Science Department; United States Air Force Academy Department of Electrical and Computer Engineering; University of Missouri-St. Louis Department of Mathematics and Computer Science; University of Akron Department of Computer Science; University of Alaska Anchorage Department of Computer Science and Engineering; University of Central Missouri Department of Mathematics and Computer Science; University of Central Oklahoma; University of Evansville; University of Hartford Electrical and Computer Engineering Department; University of Hawaii at Hilo; University of Houston, College of Technology Department of Engineering Technology; University of Louisiana at Monroe Department of Computer Science; University of Maine at Farmington; University of Minnesota-Morris; University of Mount Union; University of North Carolina at Asheville; University of North Carolina at Greensboro; University of Portland; University of South Carolina-Aiken; University of South Carolina-Beaufort; University of Washington Tacoma; University of Wisconsin-Parkside; University of Wisconsin-Stout Department of Mathematics, Statistics and Computer Science; Valparaiso University Department of Mathematics & Computer Science; Villanova University Department of Computing Sciences; Walla Walla University Department of Computer Science; Western Carolina University; Westminster College; Wheaton College (Illinois); Whitworth University; William Penn University; Williams College; Xavier University Department of Computer Science. ❖

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¹List includes schools that touched or partially completed NDC as well as those completing the study in full.