STATISTICAL ABSTRACT OF UNDERGRADUATE PROGRAMS IN THE MATHEMATICAL SCIENCES AND COMPUTER SCIENCE IN THE UNITED STATES

1990–91 CBMS Survey

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The format and organization of this report differs from that of past surveys. Hopefully the reader will find the contents useful and the format pleasing.

FOREWORD

This is the sixth in a series of CBMS reports on undergraduate programs in the mathematical sciences and computer science. The first report was published in 1965 and a new one has appeared every five years thereafter. This report compiles statistical information on a broad range of measures in both two-year and four-year institutions in the United States. It contains information on course enrollment, faculty, baccalaureate degrees, class size and format for selected introductory courses, and computer science programs, all of which were reported in previous surveys. The data were collected in fall 1990 and, in most instances, are based upon figures for this academic period. Information collected for the first time in the 1990 survey includes

- statistics on mathematical science libraries;
- information on programs for majors;
- requirements for mathematics majors;
- number of support staff in departments;
- institutional travel funds expenditures in 1989-90;
- instructional contributions of graduate teaching assistants.

This report does not contain any information on graduate programs.

The data from four-year college and university departments are reported by discipline: mathematics, statistics, and computer science. Here "mathematics department" means a department in which mathematics is the primary discipline although it may be a multiply-titled department or it may contain subunits in related disciplines. Data from other related departments, such as operations research or applied mathematics, are reported with mathematics departments.

Data on two-year colleges were obtained from the head of the mathematical sciences program. The mathematical sciences program generally includes computer science. This report uses the phrase "two-year college mathematics programs" to describe both the academic activities and the faculty of such programs.

The four-year and university departments were further divided according to the highest **mathematics** degree offered by the institution. Thus the division of statistics and computer science departments into PhD, master's, and bachelor's granting institutions may not be by that department's highest degree. In an analysis of respondents, however, there were only 3 computer science departments whose highest degree did not match the corresponding mathematics department's highest degree. Similarly, there was a good fit in statistics departments.

All estimates in this report were obtained from a sample of institutions. As such, they are subject to statistical errors caused by design, reporting techniques, and non-response. They likely differ from the numbers that would have been obtained had there been a complete census using the same survey procedures. The response rate from four-year college departments of computer science was 33%; thus data for this group have a lower confidence level than do data from the other groups. All previous CBMS surveys were based upon

samples of institutions as well. A description of the technical aspects of the survey can be found in Appendix II.

The report is organized into nine chapters. The first is a summary chapter presenting data from both two-year and four-year institutions. Chapters 2-7 give data on four-year colleges and universities in the following areas: enrollment, faculty, introductory courses including calculus I and II, programs for majors, further details on computer science majors, and mathematical science libraries. Chapter 8 presents information on enrollment and courses in two-year colleges. Chapter 9 provides data on faculty in two-year colleges. Appendix I contains detailed enrollment numbers in all four-year and university departmental courses since 1970. Appendix II is a description of survey techniques and response rates and Appendix III lists the survey respondents. Appendixes IV and V contain, respectively, the survey form for the four-year colleges and universities, and the two-year colleges.

Most tables in the report are accompanied by figures highlighting aspects of the table and a few lines of text amplifying the table or comparing the table to other tables in the report. Each chapter begins with a brief summary page which also identifies those tables in the chapter of special interest to either four-year mathematics, statistics, computer science, or two-year mathematics.

The data in this survey are in good agreement with relevant data from three other surveys. The Higher Education Survey No. 5, "A Survey of Mathematics and Statistics Departments at Higher Education Institutions," sponsored by the National Science Foundation, reported that the fall 1989 enrollment in four-year colleges and universities was 1,870,000; the 1990 figure as reported by this survey was 1,795,000. (The HES survey asked for mathematical/statistical course enrollment by level which may have been interpreted by some respondents to include departmental computer science enrollment. Enrollment data in this CBMS survey are obtained from individual course enrollment. The mathematics/statistics course total in this survey does not include the 180,000 students enrolled in computer science courses taught in mathematics departments.) The 1989 HES two-year college enrollment was 1,047,000, while this survey's 1990 figure was 1,295,000. The HES survey gave full-time four-year mathematics/statistics faculty size as 17,850; this survey reported 19,411 full-time faculty of which 16,090 taught only mathematics/statistics, 1492 taught only computer science and 1829 regularly taught both. How respondents to the HES survey reported the last two categories of faculty is not clear. The HES survey reported 6,600 full-time two-year mathematics program faculty in 1989; this survey reports 7,222 in 1990.

The Computer Science Board conducts a survey of (only) PhD granting departments, the Taulbee survey. While they combine U.S. and Canadian departments in their report, a private communication from the survey directors indicates that the U.S. PhD computer science faculty in fall 1990 numbered 2569 tenured or tenure track (or research) faculty plus 366 full-time equivalent non-tenure track teachers which included part-time faculty. This survey reported 2756 full-time faculty. The Taulbee survey reported 7,080 bachelor degrees awarded in 1989-90; this survey's figure is 7201.

In 1990 the American Mathematical Society commissioned a survey of mathematical science libraries in (only) PhD granting mathematics departments. Except for one minor category, that report is in general agreement with the relevant data from this survey, which also includes information on mathematical science libraries in non-PhD granting four-year colleges and universities.

The phrase "mathematical sciences," as used in CBMS reports prior to 1985, included computer science, but now does not, agreeing with the present NSF taxonomy. This report uses this phrase only in describing the mathematical science library. Otherwise, the phrases used are "mathematics," "statistics," and "computer science" in the hope that this makes for greater clarity.

Don O. Loftsgaarden was the consulting statistician for this survey and report. Ann E. Watkins was the principal author of the two-year college chapters with contributions by Donald J. Albers. Donald C. Rung wrote the remaining sections and was the overall supervisor.

Comments on this volume are welcome, as are suggestions for future surveys.

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