Survey of Undergraduate Education in the Mathematical Sciences 2000

Conference Board of the Mathematical Sciences

CBMS2000 Survey:

Survey Directors:
David Lutzer
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CBMS
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Mathematical Association of America

National Association of Mathematicians

National Council of Supervisors of Mathematics

National Council of Teachers of Mathematics

Society for Industrial and Applied Mathematics

Society of Actuaries

September 15, 2000

Dear Colleague:

Beginning in 1965 and continuing every five years thereafter, the Conference Board of the Mathematical Sciences (CBMS) has, with the financial support of the National Science Foundation, organized comprehensive surveys of undergraduate education in the mathematical and statistical sciences. The CBMS Survey reports on course offerings, faculty characteristics, etc., greatly supplementing and supporting the annual professional surveys conducted by the AMS-ASA-IMS-MAA Data Committee. I am certain that this 2000 Survey will provide much valuable data to departments by presenting national norms in many areas for Doctoral, Master's, and Baccalaureate degree-granting departments. This survey focuses on the mixture of faculty who teach undergraduate courses and investigates undergraduate statistics education including the statistical education of pre-service K-8 teachers. Survey responses are confidential, and results are analyzed and reported in summary form in a separate volume, which will be sent to each department responding to the survey as a small "thanks" for participating.

As part of a random sample, your department has been selected to receive the CBMS2000 Survey questionnaire. It is important that this questionnaire be completed and returned by November 1, 2000, in the enclosed envelope to: CBMS Survey, UNC Survey Research Unit, 730 Airport Road, Suite 103, CB #2400, UNC-CH, Chapel Hill, NC 27599-2400. Acting under the direction of the CBMS Survey Committee, the UNC Research Unit is collecting the completed questionnaires.

Some of the questions may not apply exactly to each department. Use your best judgement as to the answers. If you have any questions on completing this questionnaire please contact me either via phone at 757-221-4006, or via email at lutzer@math.wm.edu.

Your cooperation is essential to the success of this effort and is greatly appreciated by the Survey Committee. I thank you, and others on your staff, for participating and for finding the time to complete this questionnaire.

Sincerely,

David Lutzer
Survey Director, CBMS2000 Survey

P.S. The last item in the questionnaire asks for comments. I welcome yours.

Conference Board of the Mathematical Sciences

SURVEY OF UNDERGRADUATE PROGRAMS in the MATHEMATICAL SCIENCES 2000

GENERAL INSTRUCTIONS

Please report on undergraduate programs in the statistical sciences and computer science *under the direction of your department*. This questionnaire is being sent to each statistics and biostatistics department on your campus. Do not include data for branches or campuses of your institution that are budgetarily separate from your department.

Because departments vary in course offerings and faculty composition, some questions (or parts of questions) may not be applicable to your department. Please read the instructions carefully and complete all pertinent questions.

If you have any questions, please contact David Lutzer, Survey Director, by phone at 757-221-4006 or by email at lutzer@math.wm.edu.

Please return your completed questionnaire by November 1, 2000, to:

CBMS Survey
UNC Survey Research Unit
730 Airport Road, Suite 103
CB #2400, UNC-CH
Chapel Hill, NC 27599-2400

1. Name of your institution: _____

Name of your department: _____

2. A. Your department offers programs leading to the following degrees (check all boxes that apply):

	None	Baccalaureate	Master's	Doctoral
Mathematics	☐	☐	☐	☐
Statistics	☐	☐	☐	☐
Biostatistics	☐	☐	☐	☐
Computer Science	☐	☐	☐	☐

B. Your academic calendar is:

☐ Semester ☐ Trimester ☐ Quarter ☐ 4-1-4 ☐ Other (specify)

3. Regular Undergraduate Program Courses, Fall 2000

The following instructions apply throughout Question 3. Please read them carefully before you begin filling out the tables.

- The undergraduate courses in the following tables are listed in approximate catalogue order in two groups corresponding to statistics and computer science. The format for reporting information about courses differs somewhat from section to section, with more information asked about introductory statistics courses, less for the advanced courses.
- Throughout Question 3, count each lecture offering with separately scheduled recitiation/problem sessions as one section. For certain courses, a row is provided in which to list, for the same course, all lecture sections with recitation/problem sessions separately from all sections without recitation/problem sessions.
- Faculty holding joint appointments with another department should be counted in column #5 if they are tenured or tenure-eligible within your department; otherwise, report them in column #6 or #7 according to their budget level within your department.
- Report a section of a course as taught by a *Graduate Teaching Assistant* (TA) only when that course is taught independently by the TA; that is, the course is the TA's "own" course.

				Of the number in Col. (3), but not Col. (4), how many sections are taught by:				Of the number in Col. (3), but not Col. (4), how many sections:				
Name of Course (or equivalent)	Total Enrollment Fall 2000	Total Number of Sections	# from (3) taught by distance learning[b]	Tenured or Tenure-eligible Faculty	Other Full-time Faculty	Part-time Faculty	Graduate Teaching Assist.	Use graphing calcula-tors	Include writing components such as reports or projects	Require computer assign-ments	Assign group projects	Meet at least once a week in a setting that requires student computer use
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
3.A. STATISTICS IN YOUR DEPARTMENT												
Elementary Level												
1. Elementary Statistics: (no calculus prerequisite)												
1.1. Lecture with separately scheduled recit./problem sessions[a]												
1.2. Regular sections with enrollments of 35 or less												
1.3. Regular sections with enrollments above 35												
2. Probabiltiy and Statistics (no calculus prerequisite)												
3. Statistical Literacy/Statistics and Society												
4. Statistics for pre-service elementary or middle grades teachers												
5. Statistics for pre-service high school teachers												
6. Other elementary level courses												

Give the names of (up to) two examples of (6) with the largest enrollments:

1)

2)

[a] Remember: An elementary statistics class along with its recitation/problem sessions is to be counted as one section.

[b] At least half of the students in the section receive the majority of their instuction via Internet, TV, or other method where the instructor is *NOT* physically present.

3. Regular Undergraduate Program Courses, Fall 2000 (Continued)

Name of Course (or equivalent) (1)	Total Enrollment Fall 2000 (2)	Total Number of Sections (3)	If not offered in Fall 2000, is it scheduled in Winter/Spring 2001? Y(es)/N(o) (4)
3.A. STATISTICS IN YOUR DEPARTMENT (continued)			
Upper Level Undergraduate			
7. Mathematical Statistics (calculus prerequisite)			
8. Probability (calculus prerequisite)			
9. Stochastic Processes			
10. Applied Statistical Analysis			
11. Design and Analysis of Experiments			
12. Regression (and Correlation)			
13. Biostatistics			
14. Nonparametric Statistics			
15. Categorical Data Analysis			
16. Sample Survey Design and Analysis			
17. Statistical Software & Computing			
18. Data Management			
19. Senior Seminar/Independent Studies in Statistics			
20. Other upper level courses			
Give the names of (up to) two examples of (20) with the largest enrollments: 1)			
2)			

3.B. Enrollments in Statistics Outside of the Statistics Department

List the enrollments in undergraduate statistics courses taught outside of the statistics department or program. Please attempt to be as objective as possible, and include only courses that are substantially statistics in content, regardless of title. (If you know that such courses are exist but cannot find a reasonable number to report, simply place a check mark in the appropriate box.)

	Department or Division Offering Courses in Fall 2000					
Courses	Science	Social Science	Engineering	Business	Education	Other
Introductory Statistics						
Statistical Methods						
Design and Analysis of Experiments						
Regression						
Survey Sampling						
Special Topics						

3. Regular Undergraduate Program Courses, Fall 2000 (Continued)

3.C. To help us gauge the impact of the new program in AP Statistics on undergraduate courses in statistics, please answer the following questions:

(i) In the fall of 2000 how many students have been given credit for an introductory statstics course as a result of their score on the AP Statistics Examination? _____

(ii) Has your department introduced any new courses or course options as a result of the AP Statistics program? Yes _____ No _____

(iii) Has the number of your undergraduate majors in statistics increased since the inception of the AP Statistics program (1997)? Yes _____ No _____; Do not have a statistics major _____.

				Of the number in Col. (3), but not Col. (4), how many sections are taught by:			
Name of Course (or equivalent) taught by your department (1)	Total Enrollment Fall 2000 (2)	Total Number of Sections (3)	# from (3) taught by distance learning[b] (4)	Tenured or Tenure-eligible Faculty (5)	Other Full-time Faculty (6)	Part-time Faculty (7)	Graduate Teaching Assist. (8)
3.D. COMPUTER SCIENCE							
Lower Level							
21. Computers and Society							
22. Introduction to Software Packages							
23. Issues in Computer Science							
24. Computer Programming I (C 101 '91)[a]							
25. Computer Programming II (C 102 '91)[a]							
26. Advanced Programming & Data Structures							
27. Database Management Systems							
28. Discrete Mathematics							
29. Other lower level courses							
Middle Level							
30. Intro. to Computer Systems							
31. Assembly Language Programming							
32. Intro. to Computer Organization							
33. Intro. to File Processing							
34. Other middle level courses							
Upper Level							
35. All upper level courses							

[a] Refers to courses described in Computing Curriculum 1991, Report of the ACM/IEEE-CS Joint Curriculum Task Force, ACM 1991.
[b] At least half of the students in the section receive the majority of their instuction via Internet, TV, or other method where the instructor is *NOT* physically present.

4. Previous Year's Enrollment Figures:

Responses to this question will be used to project total enrollment for the current academic year, 2000–2001, by the pattern of enrollment in all of your department's courses for the previous academic year, 1999–2000.

The total student enrollment in your undergraduate courses was _____ for fall 1999 and

was _____ for the entire academic year 1999-2000.

5. Statistics Faculty Profile, Fall 2000

5.A. Faculty Counts, Fall 2000

In each of tables 5.A.1 and 5.A.2 report the number of faculty that belong in each box. Include all departmental faculty according to tenure or tenure-eligible status, distinguishing between such faculty on leave and not on leave. For faculty members with joint appointments, report them as *Tenured* or *Tenure-eligible* if that describes their status within your department; otherwise, report them as *Other Full-time* or *Part-time* according to their budget level within your department for fall 2000. Do not report any TA's in any of the Tables for Question 5.

If your institution does not recognize tenure, please check here ☐ then report full-time faculty who are "permanent" in the *Tenured* column, otherwise use the *Other full-time* column.

Note: Tables 5.A.1 and 5.A.2 count the same population of faculty, and should have the same total when summed.

		Type of Appointment:					
5.A.1 By Highest Degree and Gender		Tenured		Tenure-eligible		Other Full-time	Part-time (not TAs)
		Not on leave	On leave	Not on leave	On leave		
With doctorate	Male						
	Female						
Without doctorate	Male						
	Female						

		Type of Appointment:					
5.A.2 By Ethnic/Racial Status and Gender		Tenured		Tenure-eligible		Other Full-time	Part-time (not TAs)
		Not on leave	On leave	Not on leave	On leave		
American Indian, Eskimo, Aleut	Male						
	Female						
Asian, Pacific Islander	Male						
	Female						
Black or African American (non-Hispanic)	Male						
	Female						
Mexican American, Puerto Rican, or other Hispanic	Male						
	Female						
White (non-Hispanic)	Male						
	Female						
Status not known/Other	Male						
	Female						

5. Statistics Faculty Profile, Fall 2000 (continued)

5.B. Faculty Age Profile

For the tenured and tenure-eligible faculty reported in 5.A, report the number that belong in each of the boxes below. If your institution does not recognize tenure, please use the *Tenured faculty* line to report on your "permanent" full-time faculty.

Faculty Category		Age									
		Under 30	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 & over
Tenured faculty	Male										
	Female										
Tenure-eligible faculty	Male										
	Female										

5.C. Deaths, Retirements and Transitions

For the period from 1 September 1999 through 31 August 2000, report the number of your tenured or tenure-eligible faculty [if your institution does not recognize tenure, report on those who are "permanent" full-time] who:

(i) died while in full-time service _____

(ii) left full-time service due to retirement _____

5.D. Does your organization offer a "transition to retirement program" in which faculty agree to retire at a future date certain and gradually reduce their teaching assignments until that time? Yes _____ No _____

6. Departmental Information

6.A. Teaching Load

For fall 2000, the expected (or typical) teaching load for the tenured or tenure-eligible faculty reported in Question 5.A above is _____ classroom contact hours per week.

6.B. Departmental Baccalaureate Degrees

6.B.1 If you have no undergraduate major in statistics check here ☐ and go to question 7.

6.B.2 Report the number of your departmental majors awarded a baccalaureate degree by your institution, between July 1, 1999 and June 30, 2000 (include double majors): _____

6.B.3 Of the number in 6.B.2, report the number who majored in each of the following.
(In the following report each graduating student only once. Use the "Other" category for any major that does not fit the existing categories)

Area of Major	Male	Female
Statistics		
Biostatistics		
Actuarial Science		
Statistics Education		
Joint Computer Science and Statistics		
Joint Mathematics and Statistics		
Other tracks in your department		

7. Faculty teaching statistics in Fall 2000

7.A. How many distinct faculty members taught the statistics courses that you reported in 3.A for Fall 2000? _____

7.B. Of the faculty members reported in 7.A, how many had at least a masters degree (i.e., a masters or doctoral degree) in statistics or biostatistics? _____

7.C. For the faculty members reported in 7.A give the number belonging to each box in the following table

	Major field of highest degree							
Highest degree	Statistics	Biostatistics	Mathematics	Mathematics Education	Computer Science	Social Science	Education	Other
Doctorate								
Masters								
Other								

8. Academic support and enrichment opportunities

8.A Placement Tests

(i) Does your department or university offer a statistics placement program for entering undergraduate students? Yes _____ No _____; If no, go to 8.B, otherwise please complete the following.

(ii) Is the placement examination <u>required</u> for entering freshmen? Yes _____ No _____

(iii) What is the source of the placement test?

_____ test written by department
_____ test provided by Education Testing Service (ETS)
_____ test provided by American College Testing Program (ACT)
_____ test provided by Mathematical Association of America (MAA)
_____ other test provided by external source (specify name) _____

(iv) Is it <u>required</u> that entering freshmen discuss the results of the placement test with an adviser before registering for their first statistics course? Yes _____ No _____

(v) Does the placement examination lead to <u>mandatory</u> placement in the student's first undergraduate statistics course? Yes _____ No _____

(vi) Does your department periodically assess the effectiveness of the statistics placement test? Yes _____ No _____

8.B. Statistics Tutoring Centers

Does your college operate a statistics tutoring center? Yes _____ No _____
If "no", please go to 8.C; If "yes" check the services available to students through your center:

☐ computer-aided instruction
☐ computer software such as computer algebra packages or statistical packages
☐ media such as video tapes
☐ tutoring by students
☐ tutoring by paraprofessional staff
☐ tutoring by part-time statistics faculty
☐ tutoring by full-time statistics faculty
☐ Internet resources
☐ other lab or center services (specify) _____

8. Academic support and enrichment opportunities (continued)

8.C. Enrichment opportunities

Please check the opportunities available to your undergraduate statistics students:

- ☐ honors sections of courses
- ☐ statistics club
- ☐ special statistics programs to encourage women
- ☐ special statistics programs to encourage minorities
- ☐ opportunities to compete in statistics contests
- ☐ special statistics lectures/colloquium, not part of a statistics club
- ☐ outreach opportunities to local K-12 schools
- ☐ opportunities to participate in undergraduate research
- ☐ independent studies opportunities
- ☐ assigned faculty advisors

9. Preservice education of elementary school teachers.

9.A. Does your institution offer a program or major leading to certification as a teacher in some or all grades K-8?
Yes _____ No _____; If no, go to question 10. Otherwise answer the following:

9.B. Do any members of your department serve on a committee that determines what statistics courses are part of that certification program? Yes _____ No _____

9.C.

(i) Do you have a course, or course sequence, designed specifically for pre-service K-8 teachers?
Yes _____ No _____

(ii) Do you designate special sections of your regular courses for pre-service K-8 teachers?
Yes _____ No _____

9.D. Because states have different certification requirements for teachers at different levels, the rest of this question is divided into a part that asks separately about students preparing to teach in early grades (1-3) and later grades (including 5 and 6).

Including general education requirements, how many courses are pre-service teachers <u>required</u> to take in your department in order to achieve certification to teach early grades _____; later grades _____?

9.E In your judgement, which of the following courses are most likely to be taken by K-8 pre-service teachers:

For early grade certification	For later grade certification	
☐	☐	A multiple-term course designed for elementary education students
☐	☐	A single-term course designed for elementary education students
☐	☐	Introductory Statistics/Elementary Statistics (in line 3.A.1)
☐	☐	Statistical Literacy/Statistics and Society (in line 3.A.3)

10. The approximate number of hours required to complete this questionnaire was: _____

If you have found some question(s) difficult to interpret or answer, please let us know. We welcome comments or suggestions for future surveys.

_____

_____

_____

Your name: _____ e-mail: _____

Title and Department: _____

Institution and Campus: _____

Street City State Zip

Telephone: _____ Date: _____

Please return completed questionnaire by November 1, 2000, to:
CBMS Survey, UNC Survey Research Unit
730 Airport Road, Suite 103
CB #2400, UNC-CH
Chapel Hill, NC 27599-2400

Thanks to all who helped in completing this survey; I appreciate the time spent.