

**Department of Statistics**  
Prepared by Brenda Masters

Degree Program(s) Assessed	Assessment Methods Used	Numbers of Individuals Assessed
Ph.D.	Admission to Program Exam	4
	Qualifying Exam	2
M.S.	Comprehensive Written Exam	9
	Qualifying Exam	6
B.S.	Interviews	20
Mid-Level	Data Analysis	140

**Analysis and Findings**

The admission to the Ph.D. program in Statistics is dependent upon the results of a comprehensive exam which measures the learner outcomes from prior statistical education on the four areas essential to the advanced study of statistics. The areas are probability, inference, linear models, and design of experiments. Each of the four parts of the exam covers three or four program outcomes in each area. The questions are formed with a specific program outcome in mind. The finding from this exam indicates that a majority of the students who are tested for entrance into the doctor program in statistics are well prepared in the essential areas.

A qualifying exam is used to assess the learner outcomes of each Ph.D. candidate prior to completion of the degree. Performing at a passing level on this exam is essential for conferring the doctor of philosophy in statistics. The student is provided with a week to complete the written portion of this exam, thus the exam provides a student learning opportunity, in addition to being a thorough exam of the student learner outcomes associated with student's area of research. For students who complete the coursework and the research proposal, this assessment measure indicates that virtually all of them have achieved the desired learner outcomes.

The comprehensive written exam taken by all masters-level students measures the four essential areas covered by the master's program in Statistics. The areas are probability, inference, linear models and design of experiments. Each of the four parts of the exam covers three or four program outcomes in each area. The questions are formed with a specific program outcome in mind; the program outcomes are fully described in the Statistics Department Assessment Plan. The comprehensive exam for masters students is the same three hours/two days exam sequence that is used as an entrance exam for the Ph.D. degree program. The finding from this testing situation indicates that only about 12-15% of the masters students in statistics have not learned the core theoretical material necessary to understand the foundation of statistical analysis. Students who are required to do so are often successful on their second attempt.

In addition to the comprehensive exam for masters students that covers the learner outcomes from core coursework, each student is tested in written and oral exams assessing the learner outcomes from the research experience associated with the masters report. The finding of this assessment measure mirrors the result from the Ph.D. qualifying exam. For students who complete the coursework and the research proposal, this assessment measure indicates that virtually all of them have achieved the desired learner outcomes.

Part of the recent assessment effort in the Statistics Department has been to assess the Assessment Plan that was developed and approved by the Department during the previous academic year. The plan clearly identified specific learner outcomes for the various degree programs and has been helpful to direct attention to those stated outcomes in the assessment techniques that are already prevalent in the required steps for completion of the degrees.

In the previous academic year the Department of Statistics developed an Analytic Minor that was approved by the University and discussed in last year's assessment report. During the past academic year, when speaking with students about that choice for a minor, the department has conducted casual interviews with

the interested students about the effectiveness of the degree in focusing their interests and the logistics of placing the additional coursework in a four-year BS degree plan. Most students who are interested in this minor indicate that many of the courses are listed in the options of the degree plans for their majors and completing this minor would not be an extraordinary addition of hours to their plan, even though the minor has a very high number of required classes relative to the other minors on campus. Due to this assessment of their degree plans the number of hours for the Analytic Minor was not reduced.

Midlevel assessment, which was funded through assessment monies from 2003 fiscal year, to compare the different versions of the Engineering Statistics courses was designed to utilize two years of students in those courses and will be fully reported on in the annual report in 2005. The work on this project is currently proceeding with plans to collect more data during the fall of 2004. The project should culminate in a student's masters report to be completed during the spring of 2005.

### **Uses of Assessment Results**

Assessment measures over the years have indicated that the curriculum in statistics needs to be strengthened in the field of biostatistics. Many graduates are placed in the pharmaceutical field, or other medically related areas, and are in need of greater experience with biostatistical problems and courses related to topics such as controlled studies. The Department was able to add two faculty members this year who have experience in biostatistics. Courses that will be developed by these new faculty will be helpful in answering a need for more biostatistics that has been repeatedly demonstrated in the past assessment data.

As a response to information gathered about how the courses required for the analytic minor fit into the related major degree programs, the number of hours associated with that minor were not reduced.