

STATISTICS

Today most professional statistical training is received at the undergraduate, as well as at the graduate level. A major in statistics and a minor in any of the other related areas, such as mathematics, computer science, agriculture, biological sciences and social sciences provides a good blend of training suitable for many jobs in industry, government and academic institutions. It is becoming increasingly important for those in other disciplines to have good familiarity with basic statistical techniques and inference procedures.

The Program

The Department of Statistics offers a major leading to B.S., M.S. and Ph.D. degrees. Two undergraduate minors, one in applied statistics and the second in statistics; and a graduate certificate in statistics also are available. A mathematics and statistics double major, the pre-actuarial science option and a B.S. in behavioral statistics are offered at the undergraduate level.

The department provides opportunities to study both applied and theoretical aspects of statistics. Computers are extensively used in statistics instruction, and statistical software packages and programs are utilized in various courses. Data analysis is an important aspect in applied statistics courses.

Career Opportunities

There are excellent opportunities in statistics. Major corporations and most government agencies continually look for talented individuals with this type of education. Since even greater job opportunities are open to those with advanced statistical training, many undergraduates proceed directly to graduate work in statistics. Many students combine statistics with areas such as business, education, economics or biology.

Career opportunities are varied. A statistician may:

1. consult in the design and analysis of clinical studies, evaluating new pharmaceutical agents;
2. design experiments for agricultural, ecological, environmental or energy-related studies;
3. determine mortality, morbidity and accident rates for an insurance company;
4. serve as an opinion pollster for a public relations firm or a television network;
5. develop theories of learning and behavior in conjunction with psychologists;
6. determine optimal combinations and evaluate performance of various chemicals in industrial setups;
7. conduct reliability and quality control studies in various industries;
8. develop econometrics, time series and forecasting models for determining the cause and effects of various socio-economic variables on society.

Statisticians work closely with other scientists and researchers to develop new statistical techniques, adapt existing techniques, design experiments and direct analyses of surveys and retrospective studies.

The Facilities

The campus has several IBM compatible and Mac computer clusters connected to the campus network and the Internet. SAS, SPSS and IMSL are among the statistical packages available. Computer consultants are available to assist students if programming help is needed.

Statistics Curriculum

For a statistics major, 12 to 15 credits in mathematics, three to seven credits in computer science and 22 to 25 credits in statistics are required. A minor in one of the following is required: social science, physical science, biological science, business, mathematics or computer science.

Students interested in biostatistics may minor in biological sciences, approved by the chair of biological sciences.

A student interested in business statistics may minor in business administration. Computer consultants are available to assist students if programming help is needed.

The Faculty

Fu-Chih Cheng, Assistant Professor, Ph.D.

North Dakota State University, 2003

Field: Statistical Power Analysis, Statistical Image Analysis, Experimental Design

Qing Kang, Assistant Professor, Ph.D.

Kansas State University, 2005

Field: Nonparametric Statistics, Categorical Data Analysis, Applications of Statistical Methods in Biological Science, Linear Models

Rhonda C. Magel, Professor, Chair, Ph.D.

University of Missouri, 1982

Field: Nonparametrics, Inference Under Order Restrictions, Regression

M.B. Rao, Professor, Ph.D., Professor Emeritus

Indian Statistical Institute, 1973

Christopher Vahl, Assistant Professor, Ph.D.

Kansas State University, 2005

Field: Probability & Statistics, Linear & Mixed Models, Experimental Design, Applied Survey Sampling

Ronald Degges, Senior Lecturer, M.S. in Applied Statistics

North Dakota State University, 1995

Field: Survival Analysis, Nonparametrics and Regression

Tatjana Miljkovic, Lecturer, M.S. Applied Mathematics-Actuarial

Science

University of Illinois, 1996

Field: Actuarial

For Further Information

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Sample Curriculum

(Statistics Major)

General Education Requirements	Credits
First Year Experience	
Univ. 189 - Skills for Academic Success.....	1
Communication	
Comm. 110 - Fund of Public Speaking.....	3
Engl. 110, 120 - College Composition I, II.....	3, 3
English Upper Level Writing Course.....	3
Quantitative Reasoning	
Math. 165 - Calculus I.....	3
Science & Technology.....	10
Humanities & Fine Arts.....	6
Social & Behavioral Sciences.....	6
Wellness.....	2
Cultural Diversity.....	-
Global Perspective.....	-
Total	40
College and Department Requirements	Credits
Hum/Soc. Science Electives (B.S. Degree).....	6
Hum/Soc. Science Electives (B.A. Degree).....	12
Second Year Language Proficiency.....	-
Totals.....	6-12
Major Requirements	Credits
Stat. 367 - Probability.....	3
Stat. 368 - Statistics.....	3
Stat. 461 - Applied Regression Models.....	3
Stat. 462 - Introduction to Experimental Design.....	3
Stat. 476 - Actuary Exam Study II <i>or</i>	
Stat. 491 - Seminar.....	1
Electives.....	15
Totals.....	28
Related Requirements	Credits
CSci. 126 - Beginning FORTRAN <i>or</i>	
CSci. 160 - Computer Science I <i>or</i>	
CSci. 227 - Computer Fundamentals I.....	3 or 4
CSci. 222 - Discrete Math <i>or</i>	
Math. 270 - Introduction to Abstract Math.....	3
Math. 129 - Linear Algebra.....	2
Math. 166 - Calculus II.....	4
Math. 265 - Calculus III.....	4
Minor.....	16-20
Electives.....	10-15
Totals.....	48
CURRICULUM TOTAL.....	122

Behavioral Statistics Requirements

The behavioral statistics degree is a joint effort between the Department of Statistics and the Department of Psychology. Students wishing to obtain a degree in behavioral statistics should consult with an adviser in both departments. Employment opportunities include working with medical or Medicare data. Graduates of this program are expected to have good quantitative reasoning skills and to have strong people skills.

Sample Curriculum

(Behavioral Statistics Major)

General Education Requirements	Credits
First Year Experience	
Univ. 189 - Skills for Academic Success.....	1
Communication	
Comm. 110 - Fund of Public Speaking.....	3
Engl. 110, 120 - College Composition I, II.....	3, 3
English Upper Level Writing Course.....	3
Quantitative Reasoning	
Stat. 330 - Introduction to Statistics.....	3
Science & Technology	
Biol. 126 - Human Biology.....	3
Chem. 117, 117L - Chemical Concepts	
and application.....	3, 1
CSci. 114 - Microcomputer Packages <i>or</i>	
CSci. 116 - Business Use of Computers.....	3-4
Humanities & Fine Arts.....	6
Social & Behavioral Sciences	
Anth. 111 - Introduction to Anthropology.....	3
Soc. 110 - Introduction to Sociology.....	3
Wellness.....	2
Cultural Diversity.....	-
Global Perspective.....	-
Total	40
College and Department Requirements	Credits
Hum/Soc. Science Electives (B.S. Degree).....	6
Hum/Soc. Science Electives (B.A. Degree).....	12
Second Year Language Proficiency.....	-
Totals.....	6-12
Major Requirements	Credits
Psyc. 111 - Introduction to Psychology.....	3
Psyc. 350 - Research Methods I.....	3
Psyc. 351 - Research Methods II.....	3
Psyc./Stat. 480 - History and Systems <i>or</i>	
Psyc /Stat. 489 - Honor's <i>or</i>	
Psyc./Stat. 491 - Seminar.....	1 or 3
Stat. 331 - Regression Analysis.....	2
Stat. 462 - Introduction to Experimental Design.....	3
Stat. 470 - Statistical SAS Programming.....	3
200 Level Psychology Electives.....	9
200-300 Level Psychology Electives.....	6
400 Level Psychology Electives.....	6
Totals.....	39-41
Related Requirements	Credits
Math. 103 - College Algebra <i>or</i>	
Math. 104 - Finite Math.....	3
Psychology Behavior Electives.....	9
Statistics Elective.....	6
Electives.....	11-19
Totals.....	29-37
CURRICULUM TOTAL.....	122

This sample curriculum is not intended to serve as a curriculum guide for current students, but rather an example of course offerings for prospective students. For the curriculum requirements in effect at the time of entrance into a program, consult with an academic adviser or with the Office of Registration and Records.