



Department of Statistics

323 Yost Hall
 Phone 216-368-6941
 Fax 216-368-0252
 Stat.case.edu

Statistics links mathematics to other disciplines to understand uncertainty and probability in the abstract and in the context of actual applications to science, medicine, actuarial science, social science, management science, business, engineering, and to contemporary life. As technology brings advances, the statistical theory and methodology required to do them justice becomes more challenging: higher dimensional, dynamic, or computer-intensive. The field of statistics is rapidly expanding to meet the three facets of these challenges: the underlying mathematical theory, the data analysis and modeling methodology, and the interdisciplinary collaborations and new fields of application.

FACULTY

Paula FitzGibbon, M.S. (Miami University)

Lecturer

Joseph Sedransk, Ph.D. (Harvard University)

Professor

Bayesian inference, sample survey theory, methodology and applications

Danhong Song, Ph.D. (Bowling Green State University)

Lecturer

Statistical genetics, linkage analysis and association study

Jiayang Sun, Ph.D. (Stanford University)

Professor

General statistics and applications; methodologies in statistical computing and data mining; semi- and nonparametrics, biased sampling, bump hunting and mixtures; statistics in astronomy, neuroscience, imaging and information technology research

Patricia Williamson, Ph.D. (Bowling Green State University)

Instructor

Bayesian analysis, estimation, and hypothesis testing

Wojbor Woyczynski, Ph.D. (Wroclaw University, Poland)

Professor

Stochastic models, probability, random fields, time series, dynamics of chaotic processes, nonlinear diffusion, turbulence

Adjunct Faculty

Manfred Denker

Adjunct Professor

Ph.D., University of Erlangen

Harold S. Haller

Adjunct Professor

Ph.D., Case Western Reserve University

Bo Hu

Adjunct Assistant Professor

Ph.D., University of Wisconsin-Madison

Hemant Ishwaran

Adjunct Associate Professor

Ph.D., Yale University

Sunil Rao

Associate Professor,

Primary Appt. Dept. of Epidemiology and Biostatistics

Ph.D., University of Toronto

Mary Rieger

Adjunct Professor

Ph.D., University of California at Berkeley

Yaomin Xu

Adjunct Professor,

Ph.D., Case Western Reserve University

Students in statistics begin with a foundation in mathematics, then add statistical theory, plus intensive modern data analysis and a concentration in a field of each student's choice where statistics is used. The goal is to develop an appreciation of each facet of the discipline and a mastery of technical skills. This prepares students to enter a growing profession with opportunities in the academic, governmental, actuarial, and industrial spheres. For the undergraduate student looking toward graduate school, the course of study within these guidelines easily incorporates additional mathematics in preparation for the more abstract mathematical level of graduate courses. The more specialized option in actuarial science expands the basic program in statistics to incorporate topics from operations research and numerical analysis which are fundamental to actuarial theory and computation. This actuarial option includes the course work necessary to prepare for Courses 1-3 of the Society of Actuaries Exams. All undergraduate majors begin with a foundation in mathematics and a core of courses in mathematical statistics, courses in statistical methodology and courses in modern data analysis. Each student's program is individualized by the choice of an applied field of concentration according to the student's own talents and interests and by the choice of appropriate STAT electives which may be drawn from offerings by the Statistics Department and from suitable offerings by other departments at the University. The Senior Project option also allows students either to work in a research setting or to participate in interdisciplinary collaboration or in industrial consulting along with a statistics faculty member. The B.A. degree offers flexibility and the chance to pursue a wider range of interests. It also offers the possibility of expanding the interdisciplinary aspect of the program to complete the requirements for majors in two fields. Some examples of particularly attractive double majors combine statistics with computer science, biology (molecular, organismal or ecology), psychology, economics, accounting, or management science.

The B.S. degree adds a laboratory science requirement. For students seriously interested in basic science, a natural science is the logical choice as a focus for the application, and the B.S. degree is the logical choice of program.

Bachelor of Science in Statistics

The B.S. degree in statistics requires a minimum of 124 hours, including at least 68 hours of approved course work, including 27 hours in statistics, the remainder in related disciplines and a substantive field of application, to satisfy the following requirements:

- (1) MATH 121, 122, 223, 224, and 201 or equivalent;
- (2) ENGR 131 or EECS 251 or approved alternate; plus an additional higher numbered course in computation from EECS offerings or EPBI 414;
- (3) STAT 325 and 326, STAT 345 and 346;
- (4) At least 15 hours of courses in statistical methodology to be chosen from statistics courses numbered 300 and higher offered by the Statistics Department, or approved courses in statistical methodology or probability taught in biostatistics, electrical engineering and computer science, economics, mathematics, operations research, etc. At least 6 hours must be in STAT courses; STAT 243 and 244 may be counted.
- (5) Two approved courses (or more) numbered 300 or above in an approved discipline outside statistics.
- (6) A combined total of 12 hours (or more) in ASTR, BIOL, CHEM, GEOL, PHYS which may be counted toward a major in that field including at least one of PHYS 121 and 122, CHEM 105 and 106 plus 113, CHEM 107 and 108 plus 113, BIOL 110 and 210 plus 211, BIOL 110 and 220 plus 221. Students are strongly encouraged to include advanced expository or technical writing courses in their programs.

Bachelor of Arts

The B.A. degree in statistics requires a minimum of 120 hours, including at least 56 hours of approved course work, including 27 hours in statistics, the remainder in related disciplines and a substantive field of application, to satisfy the following requirements:

- (1) MATH 121, 122, 223, 224, and 201 or equivalent;
- (2) ENGR 131 or EECS 251 or approved alternate; plus an additional higher numbered course in computation from EECS offerings or EPBI 414;
- (3) STAT 325 and 326, STAT 345 and 346;
- (4) At least 15 hours of courses in statistical methodology to be chosen from statistics courses numbered 300 and higher offered by the Statistics Department, or approved courses in statistical methodology or probability taught in biostatistics, electrical engineering and computer science, economics, mathematics, operations research, systems engineering, etc. At least 6 hours must be in STAT courses; STAT 243 and 244 may be counted.
- (5) Two approved courses (or more) numbered 300 or above in an approved discipline outside statistics. Students are strongly encouraged to include advanced expository or technical writing courses in their programs. Students may pursue a B.A. with double major in statistics and a related field from within the College of Arts and Sciences. In this case, the substantive field requirement (No. 5 above) is waived.

Bachelor Degrees -

Option in Actuarial Science

The actuarial program leading to either a B.A. or a B.S. in statistics requires 30 hours in statistics and actuarial studies and must satisfy the requirements for the appropriate degree program with the following modifications of requirements (4) and (5) of the B.A. or B.S. program:

- (4) At least 12 hours of courses in statistical methodology to be chosen from statistics courses numbered 300 and higher offered by the Statistics Department, or approved courses taught in biostatistics, electrical engineering and computer science, economics, mathematics, operations research, etc. At least 6 hours must be in STAT courses; STAT 243 and 244 may be counted;
- (5) STAT 317 and STAT 318. Students ordinarily can expect to be prepared to take Courses 1-3 of the Society of Actuaries Exams upon graduation.

Minor in Statistics

A minor in statistics requires a minimum of 15 hours of approved course work in statistics. The minor must satisfy the requirements below and must include a minimum of 9 credits in courses from the Statistics Department offerings.

- (1) STAT 243 and 244 or STAT 345 and 346 or other approved sequence
- (2) STAT 208 or STAT 312 or STAT 313 or STAT 332 or STAT 333 or STAT 325
- (3) Two approved elective courses in statistics numbered 300 or above.

PROTOTYPE PROGRAMS-STATISTICS COURSE WORK

Statistics B.A. Program

Year 1

Fall

MATH 121

ENGR 131

ENGL 150

GER: Science

GER: Social Science

Physical Education Requirement

Total: 16 hours

Spring

MATH 122

GER: Arts and Humanities

GER: Science

GER: Social Sciences

Free Elective

Physical Education Requirement

Total: 16 hours

Year 2

Fall

MATH 223

STAT 243

GER: Arts and Humanities

GER: Social Sciences

Free Elective

Total: 15 hours

Spring

MATH 224

MATH 201

STAT 244

GER: Arts and Humanities

GER: Global and Cultural Diversity

Total: 15 hours

Year 3

Fall

STAT 345

EPBI 414

Substantive Field Requirement

GER: Arts and Humanities

Free Elective

Total: 15 hours

Spring

STAT 346

STAT Elective

Substantive Field Requirement

Free Elective

Free Elective

Total: 15 hours

Year 4

Fall

STAT 325

STAT Elective

Free Elective

Free Elective

Free Elective

Total: 15 hours

Spring

STAT 326

STAT 395

Free Elective

Free Elective

B.S. Program

Year 1

Fall

MATH 121

ENGR 131

ENGL 150

GER: Science

GER: Social Sciences

Physical Education Requirement

Total: 16 hours

Spring

MATH 122

GER: Arts and Humanities

GER: Science

GER: Social Sciences

Free Elective

Physical Education Requirement

Total: 16 hours

Year 2

Fall

MATH 223

STAT 243

GER: Arts and Humanities

GER: Social Sciences

Free Elective

Total: 15 hours

Spring

MATH 224

MATH 201

STAT 244

GER: Arts and Humanities

GER: Global and Cultural Diversity

Total: 15 hours

Year 3

Fall

STAT 345

EPBI 414

Substantive Field Requirement

GER: Arts and Humanities

Science Requirement

Total: 15 hours

Spring

STAT 346

STAT Elective

Substantive Field Requirement

Free Elective

Science Requirement

Total: 15 hours

Year 4

Fall

STAT 325

STAT Elective

Free Elective

Free Elective

Free Elective

Total: 16 hours

Spring

STAT 326

STAT 395

Free Elective

Free Elective

Free Elective

Total: 16 hours