MASTER OF SCIENCE IN STATISTICS, APPLIED STATISTICS CONCENTRATION

Douglas G. Simpson, Department Chair
101 Illini Hall, MC-374
725 South Wright Street
Champaign, IL 61820 USA
PH: 217-333-2167
http://www.stat.illinois.edu/

The Department of Statistics offers the Master of Science in Statistics with specialization in a variety of areas of application. The degree program consists of a core of statistics courses covering statistical theory, linear models, and statistical consulting, and further coursework in the field of application and in statistics. The program offers an additional degree for students earning an advanced degree in the area of application.

To be eligible for this program, students must be pursuing an advanced degree in a department other than Statistics at the Urbana-Champaign campus. Students interested in economic statistics should apply for a degree in a department other than Statistics at the Urbana-Champaign campus. Full statements of degree requirements are available from the head of the unit offering a specialization or from the Graduate Advisor of the Department of Statistics.

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Information listed in this catalog is current as of 10/2017
STAT 538  Clinical Trials Methodology  credit: 4 Hours.
The topics of the course focus on clinical trials designs and inferential
methods that are commonly used in the pharmaceutical industry.
Topics include fixed sample designs for normal and survival data, two-
sided group sequential design, Pocock's and O'Brien-Fleming boundaries,
general theory of group sequential design, alpha and beta spending
functions, one-sided designs with early stopping to accept the null
hypothesis, non-inferiority designs, and inferential techniques. Computing
in SAS will be emphasized.  4 graduate hours. No professional credit.
Prerequisite: STAT 410, STAT 425, and familiarity with SAS.

STAT 542  Statistical Learning  credit: 4 Hours.
Modern techniques of predictive modeling, classification, and clustering
are discussed. Examples of these are linear regression, nonparametric
regression, kernel methods, regularization, cluster analysis, classification
trees, neural networks, boosting, discrimination, support vector machines,
and model selection. Applications are discussed as well as computation
and theory. Same as CSE 542. Prerequisite: STAT 410 and STAT 425.

STAT 543  Appl. Multivariate Statistics  credit: 4 Hours.
Same as CPSC 543. See CPSC 543.

STAT 545  Spatial Statistics  credit: 4 Hours.
Theory and methods for analyzing univariate and multivariate spatial
and spatio-temporal data. Covers both fundamental theories and cutting-
edge research advances for geostatistics, and statistical methods
for aggregated data and point processes. Real data examples will be
provided in class and statistical software will be used to illustrate the
data analysis. 4 graduate hours. No professional credit. Prerequisite:
STAT 425 or equivalent.

STAT 551  Theory of Probability I  credit: 4 Hours.
Same as MATH 561. See MATH 561.

STAT 552  Theory of Probability II  credit: 4 Hours.
Same as MATH 562. See MATH 562.

STAT 553  Probability and Measure I  credit: 4 Hours.
Measures and probabilities; integration and expectation; convergence
theorems and inequalities for integrals and expectations; independence;
convergence in probability, almost surely, and mean; Three Series
Theorem; laws of large numbers. Prerequisite: MATH 447 or consent of
instructor.

STAT 554  Probability and Measure II  credit: 4 Hours.
Measure extensions, Lebesgue-Stieltjes measure, Kolmogorov
consistency theorem; conditional expectation, conditional probability,
martingales; distribution functions and characteristic functions;
convergence in distribution; Central Limit Theorem; Brownian Motion.
Credit is not given for both STAT 554 and either MATH 561 or MATH 562.

STAT 555  Applied Stochastic Processes  credit: 4 Hours.
Same as MATH 564. See MATH 564.

STAT 558  Risk Modeling and Analysis  credit: 4 Hours.
Same as MATH 563. See MATH 563.

STAT 571  Multivariate Analysis  credit: 4 Hours.
Inference in multivariate statistical populations emphasizing the
multivariate normal distribution; derivation of tests, estimates, and
sampling distributions; and examples from the natural and social
sciences. Prerequisite: STAT 410 and MATH 415, or consent of instructor.