Class Schedule - Spring 2010

Statistics

Statistics
Head of Department: Douglas G. Simpson
Department Office: 101 Illini Hall, 725 South Wright St., Champaign
Phone: 333-2167
www.stat.uiuc.edu

STAT 100  Statistics  credit: 3 hours.
First course in probability and statistics at a precalculus level; emphasizes basic concepts, including descriptive statistics, elementary probability, estimation, and hypothesis testing in both nonparametric and normal models. Same as MATH 161. Credit is not given for both STAT 100 and any one of the following: ECON 202, PSYC 235, or SOC 485. Prerequisite: MATH 012.

This course satisfies the General Education Criteria for a:
Quantitative Reasoning I

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<th>CRN</th>
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<th>Time</th>
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<th>Location</th>
<th>Instructor</th>
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<td>37469</td>
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<td>MWF</td>
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</table>

Quant Reasoning I course.

STAT 200  Statistical Analysis  credit: 3 hours.
Principles in statistical design and analysis motivated by real case studies. Statistical computing is introduced and used for data analysis. Theory and techniques include survey sampling, hypothesis testing, contingency tables, Poisson models, regression analysis,
and response surface analysis. The vital role of statistics in science is illustrated by case studies, and students learn principles related to study design, data collection, data presentation, and statistical computing, as well as technical writing and communication skills.

This course satisfies the General Education Criteria for a:
Quantitative Reasoning I

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Quant Reasoning I course.
Discovery, and Quant Reasoning I course.
Statistical Analysis, 3 hours. Principles of statistical design and analysis motivated by real case studies. Statistical computing is introduced and used for data analysis. Theory and techniques include survey sampling, hypothesis testing, contingency tables, Poisson models, regression analysis, and response surface analysis. The vital role of statistics in science is illustrated by case studies, and students learn principles related to study design, data collection, data presentation, and statistical computing, as well as technical writing and communication skills. First year Discovery Program course. Registration restricted to freshman. Students should enroll in only one Discovery course. Restricted to First Time Freshman students.

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Quant Reasoning I course.
Quant Reasoning I course.

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Quant Reasoning I course.
Quant Reasoning I course.

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Quant Reasoning I course.
Quant Reasoning I course.
Statistical Analysis for Biological Sciences

STAT 391  **Honors Individual Study**  credit: 1 OR 2 hours.
May be repeated to a maximum of 8 hours. Prerequisite: Consent of instructor.

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STAT 400  **Statistics and Probability I**  credit: 4 hours.
Introduction to mathematical statistics that develops probability as needed; includes the calculus of probability, random variables, expectation, distribution functions, central limit theorem, point estimation, confidence intervals, and hypothesis testing. Offers a basic one-term introduction to statistics and also prepares students for STAT 410. Same as MATH 463. Prerequisite: MATH 241 or equivalent.

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**STAT 408  Actuarial Statistics I**  
Credit: 4 hours.
Examines elementary theory of probability, including independence, conditional probability, and Bayes' theorem; combinations and permutations; random variables, expectations, and probability distributions; joint and conditional distributions; functions of random variables; sampling; central limit theorem. Same as MATH 408. Credit is not given for both STAT 408 and either MATH 461 or STAT 400. Prerequisite: MATH 241 or equivalent.

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</table>
STAT 410  **Statistics and Probability II**  credit: 3 OR 4 hours.

Continuation of STAT 400. Includes moment-generating functions, transformations of random variables, normal sampling theory, sufficiency, best estimators, maximum likelihood estimators, confidence intervals, most powerful tests, unbiased tests, and chi-square tests. Same as MATH 464. 3 undergraduate hours. 4 graduate hours. Credit is not given for both STAT 410 and STAT 409. Prerequisite: STAT 400; or STAT 100 and MATH 461.

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Credit Hours: 4 hours
Restricted to Graduate - Urbana-Champaign.

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<td>Monrad, D</td>
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Credit Hours: 3 hours
Restricted to Undergrad - Urbana-Champaign.

STAT 420  **Methods of Applied Statistics**  credit: 3 OR 4 hours.

Systematic, calculus-based coverage of the more widely used methods of applied statistics, including simple and multiple regression, correlation, analysis of variance and covariance, multiple comparisons, goodness of fit tests, contingency tables, nonparametric procedures, and power of tests; emphasizes when and why various tests are appropriate and how they are used. Same as MATH 469. 3 undergraduate hours. 4 graduate hours. Prerequisite: STAT 408 or STAT 400; MATH 231 or equivalent; knowledge of basic matrix manipulations; or consent of instructor.

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<td>D1G</td>
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<td>MWF</td>
<td>165 - Everitt Elec &amp; Comp Engr Lab</td>
<td>Stepanov, A</td>
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Credit Hours: 4 hours
Restricted to Graduate - Urbana-Champaign.

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Credit Hours: 3 hours
Restricted to Undergrad - Urbana-Champaign.

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</table>
STAT 424  Analysis of Variance  credit: 3 OR 4 hours.
Estimation and hypotheses testing in linear models; one-, two-, and higher-way layouts; incomplete layouts; analysis of covariance; and random effects models and mixed models. Same as MATH 465. 3 undergraduate hours. 4 graduate hours. Prerequisite: Credit or concurrent registration in MATH 415 and STAT 410.

Credit Hours: 3 hours
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Credit Hours: 4 hours
Restricted to Graduate - Urbana-Champaign.

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<td>Liang, F</td>
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Credit Hours: 3 hours
Restricted to Undergrad - Urbana-Champaign.

STAT 425  Applied Regression and Design  credit: 3 OR 4 hours.
Explores linear regression, least squares estimates, F-tests, analysis of residuals, regression diagnostics, transformations, model building, factorial designs, randomized complete block designs, Latin squares, split plot designs. Computer work is an integral part of the course. 3 undergraduate hours. 4 graduate hours. Prerequisite: STAT 410.

Credit Hours: 4 hours
Restricted to Graduate - Urbana-Champaign.

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Credit Hours: 4 hours
Restricted to Graduate - Urbana-Champaign.

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Credit Hours: 3 hours
Restricted to Undergrad - Urbana-Champaign.

STAT 426  Sampling and Categorical Data  credit: 3 OR 4 hours.
Sampling: simple random, stratified, systematic, cluster, and multi-stage sampling. Categorical data: multiway contingency tables, maximum likelihood estimation, goodness-of-fit tests, model selection, logistic regression. Computer work is an integral part of the course. 3 undergraduate hours. 4 graduate hours. Prerequisite: STAT 410.

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Credit Hours: 3 hours
Restricted to Undergrad - Urbana-Champaign.
STAT 427  **Statistical Consulting**  credit: 3 OR 4 hours.

Students, working in groups under the supervision of the instructor, consult with faculty and graduate students through the Statistical Consulting Service; readings from literature on consulting. 3 undergraduate hours. 4 graduate hours. Prerequisite: STAT 425 or consent of instructor.

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Credit Hours: 4 hours

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Credit Hours: 3 hours
Instructor Approval Required
Restricted to Undergrad - Urbana-Champaign.

STAT 428  **Statistical Computing**  credit: 3 OR 4 hours.

Examines statistical packages, numerical analysis for linear and nonlinear models, graphics, and random number generation and Monte Carlo methods. Same as MATH 493. 3 undergraduate hours. 4 graduate hours. prerequisite: STAT 410 or equivalent; knowledge of a programming language.

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Credit Hours: 4 hours
Restricted to Graduate - Urbana-Champaign.

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Credit Hours: 3 hours
Restricted to Undergrad - Urbana-Champaign.

STAT 430  **Topics in Applied Statistics**  credit: 3 OR 4 hours.
Formulation and analysis of mathematical models for random phenomena; extensive involvement with the analysis of real data; and instruction in statistical and computing techniques as needed. Same as MATH 468. 3 undergraduate hours. 4 graduate hours. May be repeated with approval. prerequisite: STAT 410 or STAT 420; or consent of instructor.

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Credit Hours: 4 hours
Restricted to Graduate - Urbana-Champaign.
Topic: Applied Multivariate Analysis

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Credit Hours: 3 hours
Restricted to Undergrad - Urbana-Champaign.
Topic: Applied Multivariate Analysis

STAT 448  **Advanced Data Analysis**  credit: 4 hours.
Several of the most widely used techniques of data analysis are discussed with an emphasis on statistical computing. Topics include linear regression, analysis of variance, generalized linear models, and analysis of categorical data. In addition, an introduction to data mining is provided considering classification, model building, decision trees, and cluster analysis. Prerequisite: STAT 400 or STAT 409, and credit for or concurrent registration in STAT 410.

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<th>Section</th>
<th>Time</th>
<th>Days</th>
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<tr>
<td>48345</td>
<td>Lecture</td>
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<td>MW</td>
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STAT 451  **Probability Theory**  credit: 3 OR 4 hours.
Same as MATH 461. See MATH 461.

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<tbody>
<tr>
<td>38066</td>
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Credit Hours: 3 hours

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Credit Hours: 4 hours
Instructor Approval Required

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Credit Hours: 3 hours
Instructor Approval Required
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<td>23 - ACES Lib, Info &amp; Alum Ctr</td>
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<td>MW</td>
<td>23 - ACES Lib, Info &amp; Alum Ctr</td>
<td>Murphy, M</td>
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**STAT 458  Math Modeling in Life Sciences**  credit: 3 OR 4 hours.  
Same as ANSC 448 and IB 487. See ANSC 448.

**STAT 511  Mathematical Statistics II**  credit: 4 hours.
Bayes estimates, minimaxity, admissibility; maximum likelihood estimation, consistency, asymptotic efficiency; testing and confidence intervals; Neyman-Pearson lemma, uniformly most powerful tests; likelihood ratio tests and large-sample approximation; nonparametrics. Prerequisite: STAT 510.

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STAT 525  **Computational Statistics**  credit: 4 hours.
Various topics, such as ridge regression; robust regression; jackknife, bootstrap, cross-validation and resampling plans; E-M algorithm; projection pursuit; all with a strong computational flavor. May be repeated if topics vary. Prerequisite: STAT 425, STAT 426, and STAT 511; or consent of instructor.

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<td>386 - Armory</td>
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STAT 551  **Theory of Probability I**  credit: 4 hours.
Same as MATH 561. See MATH 561.

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STAT 578  **Topics in Statistics**  credit: 4 hours.
May be repeated if topics vary. Prerequisite: Consent of instructor.

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Topics in Research and Writing to Doctoral Candidates in Statistics

STAT 588  **Covar Struct and Factor Models**  credit: 4 hours.
Same as EPSY 588, PSYC 588, and SOC 588. See PSYC 588.

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<td>WF</td>
<td>29 - Psychology Building</td>
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STAT 593  **STAT Internship**  credit: 0 TO 8 hours.
Supervised, off-campus experience in a field in which statistical science plays an important role. Approved for both letter and S/U grading. Prerequisite: STAT 425 and consent of instructor.

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<tr>
<td>51687</td>
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