Statistics

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. 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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<th>Type</th>
<th>Section</th>
<th>Time</th>
<th>Days</th>
<th>Location</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>60255</td>
<td>Lecture-Discussion</td>
<td>1GR</td>
<td>12:30 PM - 01:50 PM</td>
<td>TR</td>
<td>1090 - Lincoln Hall</td>
<td>Park, T</td>
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Credit Hours: 4 hours
Applied Bayesian Analysis
Restricted to Graduate - Urbana-Champaign.
Applied Bayesian Analysis: Introduction to the concepts and methodology of Bayesian statistics, for students with fundamental knowledge of mathematical statistics. Topics include Bayes’ rule, prior and posterior distributions, conjugacy, Bayesian point estimates and intervals, Bayesian hypothesis testing, noninformative priors, practical Markov chain Monte Carlo, hierarchical models and model graphs, and more advanced topics as time permits. Implementations in R and specialized simulation software. Prerequisites: STAT 410 and knowledge of R.

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<td>Park, T</td>
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</table>

Credit Hours: 3 hours
Applied Bayesian Analysis
Restricted to Undergrad - Urbana-Champaign.
Applied Bayesian Analysis: Introduction to the concepts and methodology of Bayesian statistics, for students with fundamental knowledge of mathematical statistics. Topics include Bayes’ rule, prior and posterior distributions, conjugacy, Bayesian point estimates and intervals, Bayesian hypothesis testing, noninformative priors, practical Markov chain Monte Carlo, hierarchical models and model graphs, and more advanced topics as time permits. Implementations in R and specialized simulation software. Prerequisites: STAT 410 and knowledge of R.

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<tbody>
<tr>
<td>55664</td>
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<td>2GR</td>
<td>09:00 AM - 09:50 AM</td>
<td>MWF</td>
<td>1002 - Lincoln Hall</td>
<td>Zhao, S</td>
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</table>

Credit Hours: 4 hours
Survival Analysis
Restricted to Graduate - Urbana-Champaign.
Survival Analysis: Introduction to the analysis of time-to-event outcomes. Topics include censoring, discrete survival, parametric models, nonparametric one- and K-sample methods, Cox regression, regression diagnostics, time-dependent covariates, and multivariate survival outcomes. Emphasis on key underlying concepts and practical implementation. Prerequisites: STAT 410 and knowledge of R. Recommended: STAT 420.

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<td>MWF</td>
<td>1002 - Lincoln Hall</td>
<td>Zhao, S</td>
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Credit Hours: 3 hours
Survival Analysis
Restricted to Undergrad - Urbana-Champaign.
Survival Analysis: Introduction to the analysis of time-to-event outcomes. Topics include censoring, discrete survival, parametric models, nonparametric one- and K-sample methods, Cox regression, regression diagnostics, time-dependent covariates, and multivariate survival outcomes. Emphasis on key underlying concepts and practical implementation. Prerequisites: STAT 410 and knowledge of R. Recommended: STAT 420.
**Intro to Data Science**

Lecture-Discussion  
09:00 AM - 11:50 AM  
T  
126 - Grad Sch of Lib & Info Science  
Stodden, V

Credit Hours: 4 hours  
Intro to Data Science  
Restricted to Statistics or Statistics & Computer Science major(s) or minor(s). This STAT 430 section is restricted to majors, minors, and graduate students in Statistics or Statistics & Computer Science only. All other students would register for LIS 490 (CRN 65567) or CS 498 (CRN 65575). Meets with LIS 490 (section IDS, CRN 65567) and CS 498 (section IDS, CRN 65575). Please see LIS 490 (section IDS, CRN 65567) for more information. Intro to Data Science: This course is intended to introduce students to modern programs and technologies that are useful for organizing, manipulating, analyzing, and visualizing data. We start with an overview of the R language, which will become the foundation for your work in this class. Then we'll move on to other useful tools, including working with regular expressions, basic UNIX tools, XML, and SQL. We'll also cover supervised and unsupervised statistical learning techniques made possible by recent advances in computing power. This course is very computer-oriented, so it's very important to take the time outside of class to learn by doing - to explore the software we'll be covering in class, and try out new skills on real datasets in the homework assignments. Priority registration is restricted to Statistics graduate students, and undergraduate students majoring in Statistics or Statistics & Computer Science. This restriction is expected to be removed sometime during the business day May 3rd, 2016.

**Foundations of Data Science**

Online  
ARRANGED -  
Brunner, R

Credit Hours: 3 hours  
Foundations of Data Science  
Restricted to Statistics or Statistics & Computer Science major(s) or minor(s). Not intended for students with Freshman class standing. This class is an asynchronous, online course. Please see INFO 490 (section RB, CRN 65222) for more information. Students MUST register by August 24 at 4 pm. Registration in this course after that point will not be permitted. Foundations of Data Science: This course will build a practical foundation for data science by teaching students basic tools and techniques that can scale to large computational systems and massive data sets. Students will first learn how to work at a Unix command prompt before learning about source code control software like git and the github site. Next, the Python programming language will be covered, with a focus on specific aspects of the language and associated Python modules that are relevant for Data Science. Python will be introduced and used primarily via the iPython (or Jupyter) Notebooks, and will cover the Numpy, Scipy, MatPlotlib, Pandas, Seaborn, and scikit_learn Python modules. These capabilities will be demonstrated through simple data science tasks such as obtaining data, cleaning data, visualizing data, and basic data analysis. Students must have access to a fairly modern computer, ideally that supports hardware virtualization, on which they can install software. This class is open to sophomores, juniors, seniors and graduate students in any discipline. Restriction(s): Not intended for students with Freshman class standing. The STAT 430 section is restricted to Statistics students only. All other students would register for INFO 490, CRN 65222.