Statistics: Discrete Methods (STAT 453/653) Fall 2011
Davidson Mathematics and Science (DMS) – 106
TR 4:00-5:15PM
3 credits

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Office hours:  TR 10:00AM–11:45AM + by appointment
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Course web page: http://www.unr.edu/~zal/STAT653_Fall11.html

Intro: Discrete data are routinely collected in social, geophysical, behavioral, biomedical, biological and agricultural sciences as well as in public health, marketing, education, and industrial quality control. The statistical inference for discrete data involves special methods and approaches that differ (sometimes significantly) from those for continuous random variables. In this class, we will overview real-life examples, classical and modern statistical techniques, and numerical methods aimed at answering the main question: How to make a sound and efficient inference if our observations are discrete? A professional statistical package will be used to apply the concepts discussed in the class to real data sets.

Required textbook:

Optional reading:

Tentative list of topics (may change as class proceeds):
Discrete distributions
Basic inference for discrete and categorical responses
Contingency tables
Generalized linear models, Log-linear models
Logistic regression
Historical remarks

Statistical Lab is an integral part of the course. You will be given regular take-home assignments that require application of selected statistical techniques using the package. The results should be presented in a form of illustrated reports (we will discuss the report writing in the class). The previous knowledge of is not required (but definitely will make the class easier). is a free software and it is very similar to S-plus. The portal with downloads, manuals, FAQs, and much more is located at: http://www.r-project.org/. You are encouraged to discuss the Lab assignments and can do them in groups, but your reports have to be written individually and demonstrate that you are able to perform the presented analysis independently. You may use any other statistical package if you like, but all instructions and discussions in the class will refer only to .

Midterms: There will be one midterm. The date will be announced in advance.
Final exam: Final exam will be given on Thursday, December 15, 2011, 5-7PM.

Final group project (STAT 653 only): The project will consist of comprehensive theoretical and practical statistical analysis of a data set of your choice; it will result in a project report and a short presentation that will be delivered at the end of the
semester to the class. The project should demonstrate that you are (i) well familiar with essential concepts, methods, and techniques studied in the class; (ii) able to use package \texttt{R} for analysis and report preparation; (iii) ready to present your findings to a professional audience. Projects will be done in groups of two people. A detailed discussion of how to successfully complete the project will follow in class.

**Home works** will be given weekly. You are encouraged to discuss HW assignments between each other and with instructor during office hours.

**Quizzes:** There might be occasional pop quizzes intended to help us in choosing the right course pace. Quizzes contribute to 2% of your overall performance, and may be crucial when evaluating borderline performance.

**Grading policy for STAT 653:** Your letter grade for the course will be based on Statistical Lab reports (20% altogether), midterm (30%), final exam (30%), quizzes (2%), and final project (20%).

**Grading policy for STAT 453:** Your letter grade for the course will be based on Statistical Lab reports (20% altogether), midterm (40%), quizzes (2%), and final exam (40%).

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<td>Min. Score</td>
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**Prerequisites:** MATH/STAT 352 or STAT 467/667.

**Graduate/Undergraduate levels:** Graduate students will achieve deeper understanding of the material and will be offered sufficient opportunities for work at a higher academic level. This will be done by choosing different quality and quantity of assignments for homeworks and exams; in addition, a comprehensive data analysis project will be expected from graduate students.

**Academic dishonesty** will not be tolerated and will lead to an F grade. See [http://www.unr.edu/stsv/acdispol.html](http://www.unr.edu/stsv/acdispol.html)

The Department of Mathematics and Statistics supports providing equal access for students with disabilities. Any student needing accommodations for a specific disability is encouraged to meet with instructor or any Department representative at your earliest convenience to ensure timely and appropriate accommodations.