Syllabus for STAT 3302: Statistical Modeling for Discovery II

Instructor: Dr. Sebastian Kurtek
Office: 340A Jennings Hall
My Office Hours: M 1:45-2:45PM, F 1:45-2:45PM, other times by appointment
TA Office Hours: TBD (I will announce these in class and on Carmen.)
E-mail: kurtek.1@stat.osu.edu
Lecture Location: 002 Lazenby Hall
Lecture Time: MWF 12:40-1:35PM

Textbooks and other course materials:

1. A.J. Dobson and A. Barnett (2008), An Introduction to Generalized Linear Models, Third Edition, Chapman & Hall/CRC Texts in Statistical Science

2. A.C. Rencher and W.F. Christensen (2012), Methods of Multivariate Analysis, Third Edition, Wiley. Available online at http://onlinelibrary.wiley.com.proxy.lib.ohio-state.edu/book/10.1002/9781118391686

3. Course notes will be available on Carmen

Course description: This course continues to investigate statistical models for data analysis and discovery in big data settings. The regression methods developed in STAT 3301 are extended to data settings with binary and multi-category outcomes. An introduction to some of the most commonly used statistical methods for exploring and analyzing multivariate data is also provided. Interpretation and communication of the results of analyses is emphasized. Upon successful completion of the course, students will be able to:

1. Build, fit and interpret statistical models for binary outcomes

2. Understand the difference between nominal and ordinal outcomes and build regression models that are appropriate for each

3. Recognize the types of questions that can be answered by regression models for multi-category data and structure models to answer those questions

4. Comprehend the statistical principles that underlie basic methods of multivariate data analysis

Prerequisites: STAT 3301 (Statistical Modeling for Discovery I); a knowledge of linear algebra.

Course website: Please visit http://www.carmen.osu.edu/. Check Carmen periodically for announcements about the class and other class materials.

Computing: This class requires you to use the statistical software package called R. More details will be given in class and on Carmen.

Grading Policy (*subject to small changes): Your final course grade will be based on the following weighting of assessment components: Homework = 15%, Project = 15%, Midterms 1 and 2 = 20% each, Final Exam = 30%. The following rubric will be used for determining final grades: A = 93-100, A- = 90-92.9, B+ = 87-89.9, B = 83-86.9, B- = 80-82.9, C+ = 77-79.9, C = 73-76.9, C- = 70-72.9, D+ = 67-69.9, D = 60-66.9, E = below 60.

Assessments:

1. **Homework will be due at the beginning of class on the day it is due. No late homework will be accepted.** You are encouraged to work together on the homework, but do not copy any part of a homework. Each student must produce his/her own homework to be handed in. **Electronic submissions are not permitted.** Feel free to ask me for help after you have made an attempt of the questions. The grader for the course does not have the time to provide detailed explanations on each question that is graded. To make up for this, I will try to make homework solutions detailed enough to allow you to understand how the question could be approached.

   Homework preparation rules: Put your name and the homework assignment number on the top right hand corner of every page. All homework must be submitted on 8.5"x11" paper. **Staple the pages together. We are not responsible for lost pages.** Submit the problems in order, making sure that the computer output and discussion is placed together (do not put the computer output at the end of homework). Raw computer output is not acceptable. Make it clear what parts of the output are relevant and show how they answer the questions posed in the homework.

2. Exams: There will be two midterms and one final exam.

   - Midterm 1: Monday February 18 in class
   - Midterm 2: Monday March 25 in class
   - Final Exam: Tuesday April 30 12:00PM-1:45PM

   All exams are closed book/closed notes. A basic calculator is allowed - tablets, laptops, and cellphones are not allowed. Midterm 1 covers the material up to and including Friday February 15. Midterm 2 covers the material up to and including Friday March 22. The Final Exam will cover all of the material for the course.

   Note on makeup exams: If you absolutely need a makeup exam and have a valid excuse, please see me for the necessary arrangements. However, you must notify me in advance in such a situation. **A make-up exam must be taken within a week of the missed exam.** Exceptions to this policy will be permitted only in extreme situations such as serious injury immediately prior to an exam or severe illness requiring hospitalization.

3. Project: In groups of five or four, students will be responsible for completing a project. Proposals for project ideas will be due at the start of the last class before Spring Break (Friday March 8) and the project will be due near the end of the semester. The project will consist of finding a dataset, formulating questions that can be answered with the

data, and performing an appropriate analysis to answer the questions posed. Further details, including deadlines will be given as the semester progresses.

Academic misconduct: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct http://studentlife.osu.edu/csc/.

E-mail correspondence: In order to protect your privacy, all course e-mail correspondence must be done through a valid OSU name.# account.

Special accommodations: The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; 098 Baker Hall, 113 W. 12th Avenue.

Note: Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.