Stat 3302 (Spring 2020): Statistical Modeling for Discovery II

Term: Spring, 2020
Instructor: Jared D. Huling, Ph.D.
Email: `huling.7@osu.edu`
Lecture Location: Lazenby Hall 002
Lecture Time: Mon+Weds+Fri Class ID 20274: 12:40pm–1:35pm
Office Hours: Wed 3-4pm, Thur, 1-2pm, or by appointment, Cockins Hall, Room 428C
Grader: Qing Xie, **email:** `xie.735@osu.edu`, **office hours:** see below
Course Website: Carmen
Prerequisites: Stat 3301 (Statistical Modeling for Discovery I); A knowledge of linear algebra.

Textbooks and course materials

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

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.

I will highlight other useful references as the course progresses.

Lectures

Mon, Wed, Fri, 12:40pm–1:35pm in Lazenby Hall (LA) Room 002.
Holidays: Martin Luther King Jr. Day is Mon, Jan. 20; Spring break is March 9–March 13
Please download notes from Carmen. Lectures **may not** be recorded.

Class Attendance Policy

You are expected to attend all lectures. Important announcements may be made in class.

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 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

Computing

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

Evaluation

Homework	Midterm 1	Midterm 2	Data Analysis Project	Final exam
15%	20%	20%	15%	30%

Grades will be recorded 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.

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 endeavor 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. Label any figures and tables clearly and refer to the labels when referencing them.

Exams: There will be **two midterms** and **one final exam**:

Midterm 1	Fri, Feb 14	in class
Midterm 2	Fri, Mar 20	in class
Final	Tue, Apr 28	12:00pm-1:45pm

All exams are closed book/closed notes. A basic calculator is allowed – tablets, laptops, and cellphones are not.
Midterm 1 covers the material up to and including Wed, Feb 12.
Midterm 2 covers the material up to and including Wed, Mar 18.
The final will cover all the material for the course.
There will be **no make-up** exams.

Project: In groups of 4, 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 6) 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.

E-mail correspondence: You must include "STAT 3302" in the email title. In order to protect your privacy, all course e-mail correspondence must be done through a valid OSU name.# account.

Data Analytics Learning Center: GTA/Grader Office Hours:

Graduate teaching assistants (GTAs) for Stat 3201, 3202, 3301, 3302, 3303 and 4620 will hold their office hours in the Data Analytics Learning Center (DALC) in Pomerene 151. You can meet with the GTA for our course in the DALC during his or her office hours to discuss questions you have about the course material, homework assignments, R, etc.

You are welcome to stop by the DALC when it is open even if it is not currently being staffed by the GTA for our course, e.g. if you are looking for a place to study or work on an assignment for one of the supported courses. If the DALC is staffed by a GTA for another Statistics course when you stop by, he or she will help you if possible, but may not be able to answer all of your questions.

The hours during which the GTA/grader for our course will hold office hours in PO 151 can be found at https://data-analytics.osu.edu/dalc. A complete list of hours during which the DALC will be staffed by GTAs for Statistics Department courses can also be found at that link.

In rare situations due to last minute emergencies, the GTA assigned to the DALC may not be able to attend his or her office hours. If the DALC is closed when the schedule indicates it should be open, we recommend waiting for a few minutes. If no one shows up in a reasonable amount of time, please email your instructor to let us know about the problem. You can also contact your GTA to see about arranging a make-up time to meet.

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/).

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; https://slds.osu.edu/; 098 Baker Hall, 113 W. 12th Avenue.

Disclaimer

This syllabus should be taken as a fairly reliable guide for the course content. However, you cannot claim any rights from it and in particular I reserve the right to change due dates or the methods of assessment. Official announcements will ALWAYS be those made in class.