STA 4504/5503 (Class number 19125/19150)

Fall 2020

Categorical Data Analysis

T 10:40-11:35, R 10:40-12:35

Instructor: Demetris Athienitis

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Course Website: e-Learning

Course Material: Teaching will be asynchronous except office hours and exams. Material will be provided in course website.

- Notes do deviate from textbook and you are responsible for material as taught in the notes.
- Slides. Brief slides based off the class notes.
- Videos. New (pre-recorded) videos to be created during semester.

Course Communication:

- Discussion forum (link to Windows Teams available in course website).
- Live office hours via Zoom (available in course website). Some portions may be recorded.
- E-mail for questions regarding course policies. (Ensure that STA **4504/5503** is in the subject line. Failure to do so may result in a non-response.)

Required Text(s): *An Introduction to Categorical Data Analysis*, 3rd Edition
Author(s): A. Agresti
ISBN-13: 9781119405269

Course Description: This course requires as a prerequisite a grasp of basic statistical methods including linear models such as regression and ANOVA. Course content includes description and inference for binomial and multinomial observations using proportions and odds ratios; multi-way contingency tables; generalized linear models for discrete data; logistic regression for binary responses; multi-category logit models for nominal and ordinal responses; inference for matched-pairs and correlated clustered data; loglinear models.

Prerequisite(s): STA 3024 or STA 3032 or STA 4210 or STA 4322
Credit Hours: 3

Software: You will need a computer for the homework assignments and practise. The main software used in class will be R.

Course Goals and Objectives:

1. Apply statistical tools to make inference about a single binomial proportion or two sample proportions.
2. Understand and explain the properties of different measures of association by estimating various forms of measures of association from retrospective, cross-sectional and prospective studies.
3. Analyze three-way tables.
4. Understand the fundamental importance of the logistic model.
5. Appreciate the strengths and limitations of matched sample designs.

Course Policies

The instructor reserves the right to update any parts of this syllabus as necessary.
Students will promptly be notified of any changes.

Demeanor

All members of the class are expected to follow rules of common courtesy in all classroom discussions, email messages, threaded discussion and chats. Please refer to expected class netiquette.

- All **deadlines (excluding exams) are at 23:59** of the due/end date. These are ***hard* deadlines** meaning that any open or ongoing assignments will automatically be submitted at the deadline. For example you should not start an assignment at 23:58. No late assignments will be accepted under any circumstances.
- Students are expected to work independently, unless otherwise specified in writing. **Offering** and **accepting** solutions from others is an act of **plagiarism**, which is a serious offense and **all involved parties will be penalized according to the UF Student Honor and Conduct Code**. Discussion amongst students is encouraged, but when in doubt, direct your questions to the instructor.
- Students are expected to **show and explain their work**.
- All electronically **submitted work must be as one merged file**. In Canvas, all uploaded files automatically get a grade of 0, until the teaching assistant grades them.
- Feedback will provided within two business days from the assignment deadline.

Projects/Quizzes

Under each module in e-Learning,

- **Homework** that are based on (primarily) textbook exercises.
- **Quizzes** that are *timed* and range from conceptual to applied.

All deadlines are posted on e-learning. **Assignments are automatically submitted at deadline even if in progress.**

Exams

After the completion of certain modules, exams will be administered via Honorlock. For (more) complete information about Honorlock please visit the "Start Here" page of the class website. *Due to the nature of online exams via Canvas, it is important to keep in mind that technical issues may arise and although we try to implement fail-safes, please try to plan accordingly by saving work, documenting issues and preparing any material ahead of time.*

- You must **show your work for full credit** or at least to receive partial credit if wrong.
- Exams are timed with a duration of about 75 minutes (60 minutes with up to 15 minutes provided for the startup) and will **start (for all) at 10:40 on the day of the exam**. Be sure to study the material and familiarize yourself with the procedures prior to the exam as time is limited. Start the exam at least 75 minutes before the hard deadline.
- Exams are available on the class page in Canvas for which you realistically have **only 1 attempt**.
- You are only allowed to use **one screen/monitor**.
- It is highly encouraged to use a **reliable device** with a **reliable internet connection**. Being disconnected means that you are no being longer supervised which could potentially mean that your exam will not be graded.
- Some questions will have a text window for which to write your answer. Math equations can be added in much the same way as in the discussion forum, in that they both use LaTeX. So please familiarize yourself with inserting math equations in text windows. For practise please visit `https://www.codecogs.com/latex/eqneditor.php`. Practice sets will be provided in the same format.

Allowed material:

- Instructor provided formula sheet(s) and R-reference sheet. All of which are also provided in e-Learning course page. It is recommended to have the material ready and available ahead of time (in case of technical issues, such as broken links).
- Permissible software during the exam are: RStudio. Please make sure you have RStudio already installed on your device and must be working with a blank workspace/console/command window at the beginning of the exam.
- Two sheets of scratch paper.

Important dates:

Exam #1	October 1st, at 10:40
Exam #2	November 5th, at 10:40
Exam #3	December 8th, at 10:40

Grading

Grade distribution:

Exams 1, 2 and 3	70% (10% lowest, 25% second best, 35% best)
Homework	15%
Quizzes	15% (lowest 1 dropped, conditional on 11 total quizzes)
Extra Credit	0-2% (discussion forum and classroom participation)

Final grade and can be calculated using:

$$\begin{aligned}\text{Final} =& 0.10(\text{worst exam}) + 0.25(\text{second best exam}) + 0.35(\text{best exam}) \\ &+ 0.15\left(\frac{\sum \text{homeworks}}{100} \times 100)\right) \\ &+ 0.15\left(\frac{\sum \text{quizzes} - \text{lowest}}{100} \times 100\right) \\ &(+0 \text{ to } 0.02 \text{ class and discussion forum participation})\end{aligned}$$

Letter grade assignment:

There will be *no rounding up* of scores.

		A	91 to 100	A-	88 to $<$ 91
B+	84 to $<$ 88	B	80 to $<$ 84	B-	77 to $<$ 80
C+	74 to $<$ 77	C	70 to $<$ 74	C-	67 to $<$ 70
D+	64 to $<$ 67	D	60 to $<$ 64	D-	55 to $<$ 60
E	$<$ 55				

To view the result of the letter grades to your GPA please visit the UF Grade and Grading Policies. **Final grades shown on Canvas are not accurate because they do not account for the conditional weighing of exams and quizzes.**

Make-up

Requirements for class attendance and make-up exams, assignments, and other work in this course as well as policies regarding absences, religious holidays, illness and student athletes are consistent with UF Attendance Policies.

Additional make-up policy requirements:

- Every effort should be made to complete the assignment/exam during the open period. Only extreme situations will warrant a makeup. Contact the instructor prior to the exam - as soon as you realize you will be unable to take the assignment/exam at the scheduled time. Each case will be reviewed individually. Valid and detailed documentation is a prerequisite for scheduling a makeup under such extenuating circumstances.
- If you have an emergency on the day of the assignment/exam, the instructor must be contacted by midnight of the day of the assignment/exam.
- Make-ups need to be scheduled within a week from the assignment deadline. Student is responsible for scheduling.
- Additional Note: Being on vacation or booking a trip prior to the completion of the semester is not a valid reason to request a makeup. Please reference the most recent Academic Calendar.

Addressing Issues

Technical difficulties

Please contact the UF Help desk via e-Learning "Help" tab or UF IT Service Portal. Any requests for make-ups due to technical issues must be accompanied with appropriate documentation/proof including screenshots and communication with the help desk. You MUST contact your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Grievances/Commendations

Should you have any grievances or commendations with your experience in this course you can always address them

- to the instructor at athienit@ufl.edu, or
- the Department of Statistics.

For issues that are not satisfactorily resolved at the department level or which seem to be broader than one department, students are referred to the Office of the Ombuds.

UF and CLAS Policies

Dropping, Withdrawing and Incomplete

Dropping and Withdraw

For late course drops and course withdrawals check the catalog.

Incomplete

An incomplete grade may be assigned at the discretion of the instructor as an interim grade for a course in which the student has completed a major portion of the course with a passing grade, been unable to complete course requirements before the end of the term because of extenuating circumstances, and obtained agreement from the instructor and arranged for resolution of the incomplete grade in the next term. Instructors are not required to assign incomplete grades. For complete details please visit CLAS incomplete grade policy and contract.

Accommodating Students with Disabilities

Students requesting accommodation for disabilities must first register with the Disability Resource Center (DRC). The DRC will provide documentation to the students who must then provide this documentation to the instructor when requesting information. You must submit this documentation prior to submitting any assignments for which you are requesting accommodation.

U Matter, We Care

U Matter, We Care offers care related resources and programs focused on health, safety, and holistic well-being.

Academic Misconduct

Students are held accountable to the UF Student Honor and Conduct Code.

Evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at `https://gatorevals.aa.ufl.edu/students/`. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via `https://ufl.bluera.com/ufl/`. Summaries of course evaluation results are available to students at `https://gatorevals.aa.ufl.edu/public-results/`

Tentative Course Outline

Chapter	Content	Textbook
1	Introduction	1.1-1.4.2
2	Contingency Tables	2.1-2.4, 2.6-2.7
3	Generalized Linear Models	3.1-3.4
Exam 1		
4	Logistic Regression	4.1-4.6
5	Building and Applying Logistic Regression	5.1-5.3
6	Multicategory Logit Models	6.1-6.2
Exam 2		
8	Models for Matched Pairs	8.1, 8.5
9	Modeling Correlated, Clustered Responses	9.1-9.2
10	Random Effects: GLMM	10.1-10.2
7	Loglinear Models for Contingency Tables	7.1-7.4
Exam 3		