

# 14FS STAT 7020-001 (#207275)

## Topic in Applied Statistics Categorical Data Analysis

Mondays/Wednesdays/Fridays, 2:30 pm – 3:25 pm, Room 140, 60WCHARL

**Instructor:** *Xia Wang*  
<http://homepages.uc.edu/~wang2x7>  
Department of Mathematical Sciences, French Hall West 4428E  
(513) 556-3295 (6-3295 from on campus phones)  
[xia.wang@uc.edu](mailto:xia.wang@uc.edu)

**Office Hours:** *M/W 1:20 pm-2:20 pm or by appointment*

**Course Description:** The course objective is to learn basic knowledge and skills of how to analyze categorical data. Specific topics include: basic contingency table analysis, generalized linear regression model, binary regression models, loglinear models, clustered categorical data analysis, and the current research problems in categorical data analysis. For statistical computing, it focuses on using R software for performing categorical data analysis.

**Course Webpage:** All course related information will be posted on UC Blackboard (<http://blackboard.uc.edu>), including course syllabus, reading assignments, lecture notes, handouts, homework assignments, R codes, announcements, etc. **Visit the Blackboard frequently.**

**Textbook:** Alan Agresti. (2013). *Categorical Data Analysis*, 3<sup>rd</sup> edition, Wiley.

**Lab hours:** R Software is used in this course. It can be freely downloaded from <http://www.r-project.org/>.

**Exam dates**

**Midterm** Wednesday **October 15** in class / take-home

**Final Exam** Friday **December 5** in class / take-home

**Tentative Schedule (as of August 24, 2014):** reading assignments will be assigned accordingly along with lectures.

	Topic
Week 1	Introduction to Contingency Table
Week 2	Inference for Two-way Contingency Table
Week 3	Introduction to Generalized Linear Models (1)
Week 4	Introduction to Generalized Linear Models (2)
Week 5	Logistic Regression
Week 6	Building, Checking and Applying Logistic Regression Models
Week 7	More on Binary regression; Bayesian Inference on Binary Regression
Week 8	Model for Multinomial Responses
Week 9	Loglinear Models (1)
Week 10	Loglinear Models (2)
Week 11	Clustered Categorical Data: Marginal and Transitional Models
Week 12	Clustered Categorical Data: Random Effects Models (1)
Week 13	Clustered Categorical Data: Random Effects Models (2)
Week 14	Beta-binomial Models; Negative Binomial Regression
Week 15	Current research topics

### ***Homework:***

- There will be approximately 10 sets of homework problems assigned through the semester.
- Homework will be assigned one week before its due date;
- Prepare your homework with problems in order, on **one side** of standard 8½×11 sheets, stapled in the upper left-hand corner. Please note that your solutions need to be presented in a **clear, readable format** with sufficient details. No credit will be given to solutions lack of details or hard to read.
- Electronically handed-in homework will **not** be accepted.
- Homework assignments must be handed in **at the beginning of the class** on the due date. Do not slide them under the instructor's office door or drop them off in the instructor's mailbox. They will not be accepted;
- No late hand-in. If extenuating circumstances exist, you must speak directly to the instructor.
- The evaluation of your homework includes two parts:
  - The completeness of your answers
  - On the due date, several students are selected randomly to lead the discussion on the homework problems in class. Each student will be selected at least twice during the semester.

### ***Examinations:***

- There will be one midterm (Midterm) and the final examination (Final Exam). Both include two parts: in-class part and take-home part.
- The Midterm and Final Exam dates are as specified in the syllabus or as announced if there is any change (updates will be posted on UC Blackboard accordingly). Exams will include **all materials covered in the course**, including materials posted on the Bb, in the assigned readings and in homework assignments.
- The in-class part of Midterm and Final Exam are **close-book**.
- A calculator (no cell phone calculators or PDAs) may be brought to exams.
- There will be **no schedule make-up** examinations (including Midterm and the Final Exam). When there are unavoidable circumstances, the student must contact the instructor before the exam date. **Documentation is required.** For medical circumstances, the student must contact the instructor with a written medical excuse document signed by a qualified professional.

### ***Final Course Grade:***

The upper limits for contributions to the final grade are **In-class practice problem** (15%), HW (25%, distributed as 10% for completeness and 15% for leading the homework discussion in class), Midterm (30%), and Final Exam (30%). The final grade will be converted to the traditional letter grade based on the following chart:

96-100:	A	87-89: B+	77-79: C+	67-69: D+	<60: F
90-95:	A-	83-86: B	73-76: C	63-66: D	
		80-82: B-	70-72: C-	60-62: D-	

Students should keep all returned work until they have received their final grade. It is the student's responsibility to get the graded homework and the exams from the instructor.

### ***Communication***

- ✓ Course announcements and materials are posted on Blackboard through the semester.
- ✓ Make good use of the instructor's office hours. Please ask the instructor's help as soon as possible if you had difficulty in the class.
- ✓ Beyond class and office hours, the best way to contact the instructor is by email (xia.wang@uc.edu). Please note the course email correspondence must be done via UC email accounts. The instructor cannot send email to any other account (i.e. gmail, hotmail, yahoo, etc.)

### ***Classroom Etiquette:***

Our goal is to have a classroom atmosphere that allows the class to learn the material without distractions. The following behaviors will help us achieve this:

- ✓ Please turn off your cell phones or set it to vibration before coming to class.

- ✓ Please arrive in class on time.
- ✓ Please do not disrupt others during class.
- ✓ Please do not leave class early unless you have to. If you plan to leave early, sit near the door so as to disturb as few people as possible.

***Academic Integrity Policy:***

The University Rules, including the Student Code of Conduct, and other documented policies of the department, college, and university related to academic integrity will be enforced. Any violation of these regulations, including acts of plagiarism or cheating, will be dealt with on an individual basis according to the severity of the misconduct.

***Special Needs Policy:***

If you have any special needs related to your participation in this course, including identified visual impairment, hearing impairment, physical impairment, communication disorder, and/or specific learning disability that may influence your performance in this course, you should meet with the instructor to arrange for reasonable provisions to ensure an equitable opportunity to meet all the requirements of this course. At the discretion of the instructor, some accommodations may require prior approval by Disability Services.

*(This syllabus is subject to changes.)*