

SYLLABUS

STATISTICS 659–600, 700, 720

Spring 2008

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WORLD-WIDE WEB:	http://stat.tamu.edu/~twehrly/659/659.html
TEXT:	<i>An Introduction to Categorical Data Analysis, Second Edition</i> by Alan Agresti
GRADER:	Lindsay Longsine
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PREREQUISITE: Successful completion of STAT 601, 641, or 652 or equivalent. Students who have taken only STAT 651 should note that we will use many regression-based techniques that are mainly covered in STAT 652. Please talk to me if it has been several years since your last statistics course or if you have questions about the prerequisites.

FOCUS OF COURSE: STAT 659 is intended for a mixed audience of graduate students in various fields who plan to use categorical-data methods in their own research and graduate students majoring in statistics. The level of covered material will depend somewhat on the backgrounds of the students in class and will emphasize the analysis of categorical data using SAS and interpreting the results.

GRADING POLICY

1. Examinations will be given in class on Friday, February 22, and Friday, April 11. The final examination will be held on Tuesday, May 6, 3:30-5:30.
2. Homework will be assigned regularly, and it will be turned in and graded. You may discuss the homework problems with other students, but you should write up your solutions independently. Do not copy other students' solutions, solutions from previous years, or solutions from a solutions manual.

3. If you are unable to take a test when scheduled because of illness, accident, or circumstances beyond your control, notify me by telephone before the exam is given. A make-up test will be scheduled as soon as possible.
 4. A grade of Incomplete (I) will be given only in the event that circumstances beyond your control were the cause of your missing class for an extended period. This grade is not to be given because you feel that you have too much other work or study or because you think that you will not earn an acceptable grade in the course.
 5. A course average from 90 to 100 will be an A, from 80 to 89 will be a B, etc. The course average will be determined from the two midterm exams, 25% each, homework, 10%, and the final exam, 40%.
- **ACADEMIC INTEGRITY STATEMENT:** “An Aggie does not lie, cheat, or steal or tolerate those who do.” The Aggie Honor Council Rules and Procedures are available at <http://www.tamu.edu/aggiehonor>.
 - **STATEMENT ON PLAGIARISM:** As commonly defined, plagiarism consists of passing off as one’s own ideas, words, writing, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section ”Scholastic Dishonesty.”
 - **STATEMENT ON DISABILITIES:** The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Office of Disability Services in Room B118 of Cain Hall (phone 979-845-1637).
 - **COPYRIGHT NOTICE:** The handouts used in this course are copyrighted. By “handouts,” I mean all materials generated for this class including syllabi, exams, in-class material, and computer examples. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission.

Instructions for Using the STAT 659 Website:

Since STAT 659 will be offered as a distance course in addition to be taught locally, all students will have access to streaming videos of the lectures. All of the information for the course will be accessible on the distance course website. To access the website, you will need to register according to the following instructions:

1. Go to <http://dl.stat.tamu.edu/dostat/> and click on the REGISTER HERE link.
2. Fill in all of the information and click on SUBMIT.
3. Log into <http://dl.stat.tamu.edu/dostat/> using the information entered in step 2.
4. Click on the Add Course link to the left.
5. Fill in the Course Reference “xxxx” and Registration Code “xxxx” and press Register. The codes are the characters within the quotes, but do not include the quotes. I will e-mail these codes to the students enrolled in the class.

After you have registered, take a look at the resources. The recorded lectures will be found under “Videos”. Under “Files” you will find the lecture notes and examples.

STATISTICS 659—Tentative Syllabus

Topic	Chapter
I. Introduction to Categorical Data and Goodness of Fit	1
A. Binomial data	
B. Multinomial data	
C. Poisson data	
D. Testing goodness of fit	
II. Contingency Tables	2
A. Structure of tables	
B. Comparing proportions	
C. Odds ratio	
D. Chi-squared tests	
E. Testing independence for ordinal data	
F. Exact tests for small samples	
G. Three-way contingency tables	
III. Generalized Linear Models	3
A. Components of GLMs	

	B. GLMs for binary data	
	C. GLMs for count data	
	D. Poisson regression	
	E. Model inference and model checking	
IV.	Logistic Regression with Dichotomous Responses	4
	A. Interpreting logistic regression	
	B. Inference for logistic regression	
	C. Logistic regression with qualitative predictors	
	E. Multiple logistic regression	
V.	Building and Applying Logistic Regression Models	5
	A. Strategies in model selection	
	B. Model checking	
	C. Other topics	
VI.	Multicategory Logit Models	6
	A. Logit models for nominal responses	
	B. Cumulative logit models for ordinal responses	
VII.	Loglinear Models for Contingency Tables	7
	A. Loglinear models for two-way and three-way tables	
	B. Inference for loglinear models	
	C. Loglinear-logistic connection	
	D. Independence graphs and collapsibility	
	E. Modeling ordinal associations	
VIII.	Models for Matched Pairs	8
	A. Comparing dependent proportions	
	B. Logistic regression for matched pairs	
	C. Comparing margins of square contingency tables	
	D. Symmetry and quasi-symmetry for square tables	
	E. Analyzing rater agreement	
IX.	Modeling Correlated, Clustered Responses	9, 10
	A. Marginal models versus conditional models	
	B. Marginal model with generalized estimating equations	
	C. Random effects modeling of clustered categorical data	