

STA 6209: Design and Analysis of Experiments

Spring 2011

Professor George Casella

408 McCarty Hall C

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Credits: 3

Prerequisite: STA 6167 or 6208 or permission of instructor.

Teaching Assistant:

Claudio Fuentes (cfuentes@stat.ufl.edu)

No Classes Jan 10,12,14,17

Lecture and office hours

Lectures: MWF Period 5: 11:45-12:35

Griffin- Floyd 230

Office Hours: To be announced

Textbook *Statistical Design*. Casella, Springer-Verlag 2008

Course Web Page

The web page for the course is

<http://www.stat.ufl.edu/casella/STA6209/>

Homework You will be assigned approximately 10 problems every two weeks. All of the odd-numbered exercises have solutions posted on the web. Every other Monday will be devoted to solving problems, and you are expected to come to class with all ten problems solved. Students will be chosen randomly to present solutions on the board. In addition one problem, randomly chosen by me, will be handed in for grading.

I would like to encourage you to hand in your assignments in Latex, to get you more familiar with it. Latex is available as a free download from <http://www.miktex.org/> for the pc. For the mac you can download Texshop for free.

First Problem Session Monday January 24

Course Description

The strategy that I will use will be to go in the order of the text and try to cover as many topics as possible.

Term Project You will be required to write a five page term paper (No more than 5 pages, 1 1/2 spacing, 11pt font) and a presentation (five minutes) that does the following:

- (a) Select a design, one that is not covered in class. You will also need to find a journal article that uses the design.
- (b) Describe the properties of the design, its advantages and disadvantages over other designs.
- (c) Explain how to implement the design, randomization, etc.
- (d) Analyze a data set that has been collected according to the design. (This could be simulated data, but real is preferred).
- (e) Compare and contrast the chosen design with at least one reasonable alternative. Discuss why the chosen design is better, or not.
- (f) The presentation should summarize your finding in no more than 10 slides.

Project Due Dates:

- (a) A one-page description of your project is due on **MARCH 25**. This needs to identify the design and the paper (complete references).
- (b) The presentation must be ready by **APRIL 8**
- (c) The term paper is due **APRIL 25**

Grades

Homework: 40%

Project Outline: 10%

Presentation: 20%

Paper: 20%

Participation: 10%

Each HW problem will be graded on a scale of 0-4. Homework is due in the TA mailbox by 5pm of the due date. If your homework is late it will be graded on a scale of 1-3.

Schedule

Refer to the schedule below. You are responsible for knowing when assignments are due!!!

Finally, what follows needs to be here according to UF regulations. Make sure you read it carefully. This is serious stuff.

Academic Honesty: The University of Florida requires all members of its community to be honest in all endeavors. Cheating, plagiarism, and other acts diminish the process of learning. When students enroll at UF they commit themselves to honesty and integrity. Your instructor fully expects you to adhere to the academic honesty guidelines you signed when you were admitted to UF. As a result of completing the registration form at the University of Florida, every student has signed the following statement: "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University. Furthermore, on work submitted for credit by UF students, the following pledge is either required or implied: On my honor, I have neither given nor received unauthorized aid in doing this assignment. It is to be assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the professor. This policy will be vigorously upheld at all times in this course.

Students with Disabilities Act: The Dean of Students Office coordinates the needed accommodations of students with disabilities. This includes the registration of disabilities, academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services, and mediating faculty-student disability related issues. Dean of Students Office, 202 Peabody Hall, 392-7066. www.dso.ufl.edu

Campus Helping Resources: Students experiencing crisis or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. Both the Counseling Center and Student Mental Health provide confidential counseling services at no cost

for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career and academic goals, which interfere with their academic performance. The Counseling Center is located at 301 Peabody Hall (next to Criser Hall). Student Mental Health is located on the second floor of the Student Health Services in the Infirmary.

Service	Location	Phone	Services provided
University Counseling Center	301 Peabody Hall	392-1575 www.counsel.ufl.edu	Personal and career counseling
Student Mental Health	Student Health Care Service	392-1171 www.hsc.ufl.edu /shcc/smhs.htm	Personal counseling
Sexual Assault Recovery Services (SARS)	Student Health Care Service	392-1161 counseling	Sexual assault
Career Resource Center	Reitz Union	392-1601	Career development assistance and counseling

Software Use: All faculty, staff and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

	Tentative Topic	Monday	Wednesday	Friday	Comments
3-Jan	Basics				
10-Jan	Basics	No Class	No Class	No Class	
17-Jan	CRD	No Class			
24-Jan	CRD	Problem Session			
31-Jan	Blocking				
7-Feb	Blocking	Problem Session			
14-Feb	Blocking				
21-Feb	Blocking	Problem Session			
28-Feb	Review				
7-Mar	Relax	Spring Break	Spring Break	Spring Break	
14-Mar	Split Plot				
21-Mar	Split Plot	Problem Session			Project Outline Due
28-Mar	Confounding				
4-Apr	Confounding	Problem Session	No Class	Presentations	
11-Apr	Confounding				
18-Apr		Presentations	Presentations - Last day of class		Project due no later than Monday April 25

STA6209: Statistical Design Spring 2011
Prof. Casella

Assignment	Due Date	Chapter	Problems
1	Monday 1/24	1	1.3, 1.4, 1.5, 1.6ab, 1.13a, 1.16,1.21a, Stat Majors: 1.9, 1.23

Additional Problem An experiment was conducted on the control of the citrus snout beetle by 5 insecticides (A-E) applied in concentrations determined on an equal cost basis. Each treatment was applied to five trees in five different stands. The number of dead beetles was observed during the four week period following spraying.

Stand	A	B	C	D	E
1	24	67	25	117	145
2	27	54	42	77	47
3	38	149	87	70	202
4	39	129	72	161	182
5	28	134	115	193	210

1. Explain how you would carry out the randomization of treatments to trees
2. As stated, would you this experiment a completely randomized design or a randomized complete block design?
3. Analyze these data according to what you feel is the appropriate design. State and test the overall null hypothesis. (Don't be overly concerned by normality violations, but you should suggest a transformation of the data.)
4. The experimenter is also interested in finding out (i) Which insecticide is the most effective? and (ii) Does insecticide E perform better than insecticide C? Answer these questions for the experimenter.