

Syllabus Spring 2020

EXST7014 –Experimental Statistics II

Class Meets : Tuesday and Thursday from 10:30 to 11:50 AM in RM 241 Lockett Hall		
Professor: Bin Li		
Office	173 Woodin Hall (aka Agriculture Administration Building)	
Office hours	Tu and Th 10:00–10:30AM (or by appointment)	
Telephone	(225) 578 - 1343	
Internet materials	Email address: bli@lsu.edu https://www.lsu.edu/agriculture/exst/ (department home page) http://statweb.lsu.edu/faculty/li/teach/exst7014/	
Labs are held in Room 44, Woodin Hall (aka Ag Admin Bldg.)		
Lab Instructor	Alexander Tryforos Email: atryfo1@lsu.edu	
Office	Rm. 71B, Woodin Hall Office Phone: 578-8394	
Office hours	Tuesday 3:30PM –4:30PM (or by appointment)	
Lab Times	Session 1: Wednesday 11AM –12:50PM; Session 2: Wednesday 9-10:50AM	
Grading Points:	2 exams @ 100 points each	200
	1 final @ 150 points	150
	Group Poster	50
	Weekly lab assignments @ 100 points total	100
	TOTAL	500
Exam Schedule: See course webpage for confirmation of all dates		
First Exam	Tuesday, February 18, 2020 – Exam 1	
Second Exam	Tuesday, April 7, 2020 – Exam 2	
Poster proposal due	Thursday, February 13, 2020	
Poster due	Tuesday, April 28, 2020	
Final Exam	3:00PM-5:00PM, Wednesday, May 6, 2020	
Course Grading:	(Exam 1 + Exam 2 + Poster + Lab + Final) / 5	
Letter grade	Guaranteed minimum letter grade assignment	
	90 – 100 points, minimum grade of	A-
	80 – 89.9 points	B-
	70 – 79.9 points	C-
	60 – 69.9 points	D-

TEXT (recommended but not required): Rudolf J. Freund, Donna Mohr & William J. Wilson . 2010. Statistical Methods (3rd Edition) Academic Press, N.Y., 824 pages. (ISBN: 978-0-12-374970-3). Also acceptable are some older editions, edition 2 (2003) and the revised edition (1997) area acceptable, the 1993 edition is unadvisable. Textbook is recommended, not required. It is used for lab assignments and as a reference.

Catalog Course Description : *7014 Experimental Statistics II (4) F,S Prereq.: EXST 7005 or equivalent. 3 hrs. lecture; 2 hrs. lab. Credit will be given for only one of the following: EXST 7013, 7014, 7015, 7019. Multiple classification analysis of variance and covariance, individual degrees of freedom, factorial arrangement of treatments, and multiple regression; emphasis on science and laboratory research problems.*

Note the prerequisite: “EXST7005 or equivalent”. EXST7003 and EXST7004 are equivalent. If you have not had one of these you need permission of the instructor.

Course content

- Introduction
- Exp Design Identification
- Simple Linear Regression (SLR) – review
 - Calculations and Equations
 - Example
- Intrinsically Linear Regression (Curvilinear)
 - Example
- Matrix Algebra Introduction
 - Matrix Sweepout Example
- Multiple Regression** – extra sum of squares example
 - Regression Diagnostic Criteria
 - Multicollinearity
 - Variable Diagnostics
 - SENIC example
 - Observation Diagnostics
 - Variable Selection
- Polynomial Regression (Curvilinear) with example
- Logistic Regression** with example
- Analysis of Covariance** with example
- Analysis of Variance** – Introduction
 - ANOVA Example
- Experimental Design**
 - Design layouts
 - Creating Expected Mean Squares
 - Examples
- Post ANOVA Tests and Calculations**
 - Post ANOVA Contrasts
 - Orthogonal Polynomial Tables with examples
- Randomized Block Design with example
- Treatment arrangements** with examples
- SplitPlot with examples
 - Covariance Structures
- LSMeans
- Analysis of Covariance (Revised, time permitting) with example

FAQ and Rules

This first day information handout is not repeated in its entirety in the course packet, so **don't lose it**.

“Common” courtesies: I expect you to refrain from talking in class and please **SILENCE YOUR CELLULAR PHONE WHILE YOU ARE IN CLASS!!!**

This is not a distance ed class – attendance is expected.

Attendance at review sessions (when offered) is optional. The intent is to answer your questions, no materials will be presented and no new material will be covered.

Daily Design

We will go over a design identification problem for each class. They are in your course package. You should plan on examining the design **BEFORE** class.

A daily design will consist of specifying the dependent variable, experimental and sampling units, treatments, blocks, random effects, etc.

I do not intend to spend much time on this daily activity. I will allow a few minutes for you to discuss the answer and then I will give you the answers.

We will address most design concepts in the design section of the course (following regression). However, some will only be covered in the daily design.

Notes on Exams

Adjustments of exam scores must be made within 48 hours of the return of the exam.

Final exams not returned.

All exams and the final are in the regular classroom.

On the exam you will be allowed to bring a **calculator**

- I do not expect to have many calculations on the exam, but there may be some.
- For example, calculating a t-test for a slope for a hypothesized value other than zero (thought this may be in the output, always check first).
- Also confidence intervals on slopes and treatment means.

You may bring one “cheat sheet” to class; an 8.5 by 11 page written on both sides. I do not collect these pages. The number of pages you may have for the 2 exams and final are 1 for the first exam, 1 for the second exam & 3 for the final exam.

I will provide you with tables for an exam when I feel they are needed. You will need to understand MY tables. Tables are available in the course packet and in the internet.

Cheating and Plagiarism: This course is conducted in accordance with university policy concerning cheating and plagiarism. Neither will be tolerated, of course.

This syllabus is meant to be suggestive, not absolute. Any and all of the information on this syllabus is subject to change at any time, including exam dates, office hours, etc. Changes will be announced in class and via email. We may cover more than what is listed on the syllabus, or less. College rules require that grading policies, as described in the Syllabus, are carved in stone.

Poster Project

A poster project is required for EXST7015. This project will consist of a poster on some statistical analysis. The analysis will employ one or more of the techniques covered in the course. Students should work together in groups of 3 or 4 on the report, and each group will turn in a single poster with the names in alphabetical order. Groups of 2 or 5 students will be allowed by permission only. **Only one student from the Department of Experimental Statistics is allowed per group.**

A preliminary proposal for the project is due about a month into the semester (see course calendar online). The proposal should include the names of the persons in the group, a description of the data set and its source, and the type of analysis that is to be done. The data set should be an original data set. Please give enough information about what you intend to do that I can provide suggestions for analytical procedures not yet covered in the course. I will need to know what variables are available in the dataset, particularly whether they are quantitative or qualitative.

If you are not a member of a group by the preliminary proposal due date turn in a paper with your name and let me know if you have a dataset. I will either join individuals not in a group into a single group (if someone has data) or I may modify an existing group by adding individuals who have not joined a group.

The poster should be turned in the form of a single PowerPoint slide. The size should be of 4 feet by 3 feet. In addition to the poster, please provide an appendix with the computer program and output for the statistical analysis. These may also be turned in as WORD.DOC files, as TEXT.TXT files (the SAS .LST and .LOG files are TXT files), as HTML files or as PDF files.

The poster is due on Tuesday of the last week of class. It should be submitted in electronic form, either on a CD or via email (bli@lsu.edu). No extensions can be granted as this is the last week of classes. Only one member of each group need turn in a poster.

I will show you some examples of posters from previous semesters later.

Posters typically include the information below as text sections, though some may be combined.

- a) A header with poster Title and Authors (alphabetical order please)
- b) Abstract and Introduction (together not to exceed 1/3 of the poster)
- c) Description of the data set and Methods for the scientific and statistical analysis
- d) Supporting tables and graphics
- e) Results and Conclusions
- f) References (including source of data)

I am obviously most interested in the methods, tables, graphics and results. My evaluation will be based on the following considerations; (most important) appropriateness, correctness and completeness of the statistical analysis, (secondary consideration) organization of the material, conciseness and clarity of the presentation.

Tips of posters:

- 1) I would like the poster in "PowerPoint", either the 2003 format (ppt) or 2007 (pptx).
- 2) The size of the poster should be a custom size of 48 inches by 36 inches. Landscape is preferred, but portrait is acceptable.
- 3) Background for the poster can be a solid color, color of varying shades (gradients) or an image. Please **do not use drawn "patterns"** (e.g. striping or cross hatching) in either the background of the poster or the text boxes.
- 4) Make sure the poster is easily readable. Keep transparency to a minimum, make sure text is clearly visible against the background.