

Term Information

Effective Term Autumn 2019

General Information

Course Bulletin Listing/Subject Area Statistics
Fiscal Unit/Academic Org Statistics - D0694
College/Academic Group Arts and Sciences
Level/Career Undergraduate
Course Number/Catalog 3410
Course Title Principles of Data Collection and Analysis
Transcript Abbreviation Prin Data Collect
Course Description Principles of designing experiments; analysis of variance techniques for hypothesis testing; simultaneous confidence intervals; block designs; factorial experiments; random effects and mixed models; observational data
Semester Credit Hours/Units Fixed: 3

Offering Information

Length Of Course 14 Week
Flexibly Scheduled Course Never
Does any section of this course have a distance education component? No
Grading Basis Letter Grade
Repeatable No
Course Components Lecture
Grade Roster Component Lecture
Credit Available by Exam No
Admission Condition Course No
Off Campus Never
Campus of Offering Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites Prereq: 3201 and 3202; or permission of the instructor.
Exclusions
Electronically Enforced Yes

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code 27.0501
Subsidy Level Baccalaureate Course
Intended Rank Junior, Senior

Requirement/Elective Designation

Required for this unit's degrees, majors, and/or minors

Course Details

Course goals or learning objectives/outcomes

- Grasp the basics of descriptive and inferential statistics for designed experiments.
- Understand the differences between observational studies and designed experiments, and the limitations inherent in analyzing observational data.
- Understand principles of good design, such as randomization, replication, and blocking.
- Appreciate the importance of the assumptions that statistical models are based on.
- Understand and use appropriate statistical notation and terminology.
- Understand the fundamental components of ANOVA models (e.g., main effects and interactions).
- Effectively implement statistical analyses for designed experiments in statistical software.
- Summarize an analysis appropriately.

Content Topic List

- Basic principles of experimental design
- Observational studies
- Designs with one source of variation
- Designs with two or more sources of variation
- Sample size determination
- Contrasts and simultaneous confidence intervals
- Assessment of model assumptions
- Factorial experiments
- Block designs
- Random and mixed effects models

Sought Concurrence

No

Attachments

- STAT3410.pdf

(Syllabus. Owner: Lee, Yoonkyung)

Comments

- This course proposal is to be considered concurrently with the program proposal for the undergraduate Statistics major. *(by Lee, Yoonkyung on 08/28/2017 05:12 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Lee, Yoonkyung	09/04/2017 09:17 PM	Submitted for Approval
Approved	Lee, Yoonkyung	09/04/2017 09:27 PM	Unit Approval
Approved	Haddad, Deborah Moore	09/05/2017 10:55 AM	College Approval
Pending Approval	Nolen, Dawn Vankeerbergen, Bernadette Chantal Oldroyd, Shelby Quinn Hanlin, Deborah Kay Jenkins, Mary Ellen Bigler	09/05/2017 10:55 AM	ASCCAO Approval

Syllabus for Stat 3410: Principles of Data Collection and Analysis

Instructor:

Office:

Office Hours:

Office Phone:

E-mail:

Format: Three credit hours; three 55-minute in-class meetings per week

Prerequisites: Stat 3201 and Stat 3202

Required Text: Design and Analysis of Experiments, 8th edition, by Douglas C. Montgomery, John Wiley & Sons, 2013.

Course Description and Learning Outcomes: This course covers the basic principles of data collection, including observational studies, designed experiments, and the techniques used to analyze experiments that follow standard experimental designs. Specific designs to be covered include one-way ANOVA, two-and-higher-way ANOVA, factorial designs, block designs, and models with random effects. Statistical software will be used in the course to carry out analyses throughout the course.

Upon successful completion of the course, students will be able to

1. Grasp the basics of descriptive and inferential statistics for designed experiments
2. Understand the differences between observational studies and designed experiments, and the limitations inherent in analyzing observational data
3. Understand principles of good design, such as randomization, replication, and blocking
4. Appreciate the importance of the assumptions that statistical models are based on
5. Understand and use appropriate statistical notation and terminology
6. Understand the fundamental components of ANOVA models (e.g., main effects and interactions)
7. Effectively implement statistical analyses for designed experiments in statistical software
8. Summarize an analysis appropriately

Homework: Homework problems will be assigned and graded weekly.

Exams: There will be two in-class exams and a final exam. Statistical tables will be provided as needed. Calculators may be used on the exams, but the calculators on cell phones, PDAs, or any other communication device are NOT allowed.

Full credit on homework and exam problems: You need to show your justification for your work on each homework or exam problem. Answers without work will not receive full credit.

Final Grade:

The final course grade will be based on the following weighting of assessment components:

Homework – 25%	Midterm 1 – 25%
Midterm 2 – 25%	Final exam – 25%

Tentative Course Schedule:

Week	Topic
1	Review of basic principles of statistical inference
2	Principles of experimental design
3	Observational studies
4	Designs with one source of variation
5	Designs with one source of variation, sample size determination
6	Inferences about contrasts and treatment means
7	Checking model assumptions
8	Experiments with two crossed treatment factors
9	Several crossed treatment factors
10	Fitting multi-factor models
11	Block designs
12	Analysis of block designs; examples
13	Models with random effects
14	Analysis of models with mixed effects

Academic Misconduct: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

Special Accommodations: Students with disabilities (including mental health, chronic or temporary medical conditions) that have been certified by the Office of Student Life Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office of Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614-292-3307, slds@osu.edu; slds.osu.edu.