

Statistics 3410: Principles of Data Collection and Analysis

Autumn 2019 Course Syllabus

Lectures: 3:00pm – 3:55pm on Mondays, Wednesdays, Fridays in McPherson Lab, Room 2019.

Instructor: Dr. Chkrebtti

Graduate Teaching Assistant: Jianhao Zhang

Office Hours:

- Instructor: Wednesdays 10am - 11am and 4pm - 5pm, 429 Cockins Hall (CH). Individual appointments outside of office hours must be requested via email and will not be available on short notice. An appointment request should include a list of the student's available meeting times for the next three to five business days.
- Graduate Teaching Assistant: Thursdays and Fridays 9:10am - 10:10am, 122 Cockins Hall (CH)

Email: **Begin subject with “STAT 3410”**; use my OSU email *chkrebtti.1@osu.edu* and avoid using the Carmen email tool. In order to protect your privacy, all course email correspondence must be conducted using your valid OSU name.# email account: any email from a non-OSU account will not be answered. I will attempt to answer emails within 48 hours, however, due to the large volume of emails this may not always be possible. Before writing an email, check whether the question has already been answered in the syllabus, the notes, or the textbook. Also please consider whether your question would be best answered in person during office hours. If your email question may be helpful to other students, I will post the answer on Carmen.

- Instructor: *chkrebtti.1@osu.edu* (please do not use Carmen to contact me)
- Graduate Teaching Assistant: *zhang.4487@osu.edu*

Extra help: The Mathematics and Statistics Learning Center (MSLC) provides free tutoring for most undergraduate statistics courses (including this one). More information can be found here: <https://stat.osu.edu/undergraduates/tutoring>. Schedules and other information will be provided on an ongoing basis.

Special circumstances: Special circumstances, such as adverse life events, health issues, or emergencies, can affect anyone. Please know that I am committed to accommodating reasonable requests for these reasons. Your success in this class is very important to me. So, if you experience a situation which may affect your progress through the class, please **email me as soon as possible** so that we may make arrangements. Note that any such accommodations will not be designed to

provide an unfair advantage to anyone, and may require proof consistent with departmental policy.

Course Description and Learning Outcomes: This course covers principles of data collection and data analysis. The course introduces students to the primary ideas involved in designed vs. observational studies, and considers appropriate statistical methods for each. It also covers the basic principles of experimental design 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. The JMP software will be used in the course to carry out all analyses and to provide experience to students in data analysis using JMP.

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

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

Prerequisites: STAT 3201 and STAT 3202

Textbook: The required textbook for this course is:

- *Design and Analysis of Experiments*, 9th edition, by Douglas C. Montgomery, Wiley, 2017

Course Website: Important announcements, course materials, homework problems, computing references, and other information about the class are posted on Carmen (carmen.osu.edu, login with your web ID).

Homework Assignments: Homework will be assigned approximately biweekly. It will consist of mostly textbook-style problems, problems motivated by real-world applications, and analyses requiring the use of statistical software. You are encouraged to work together on assignment problems, but each student must hand in his or her own work, written in his or her own words. **Do not copy any part of another student's homework including computer code or output.** Use of homework solutions distributed in previous offerings of the course or available on the web constitutes academic misconduct and will be handled according to university rules. **Sharing or disseminating solutions, or in any way knowingly enabling others to commit academic misconduct also constitutes academic misconduct, and will be reported. A hard copy of the homework solutions should be submitted at the beginning of class on the due**

date. The solutions may be handwritten or typed, while any software output must be printed and stapled to the submission. It is the student's responsibility to find a working printer before the deadline (please note that it is inappropriate to ask your instructor or teaching assistant to print out your homework: consider using the computer labs or asking a friend). Please be sure that the questions are clearly labeled, all supporting work (including software output) can be easily identified, and that all figures/tables are referenced and interpreted in the text. **Electronic versions of homework submissions will not be accepted unless permission from the instructor is obtained in advance.** If advance permission is not obtained, and the reason is not a provable emergency, the instructor reserves the right to consider the homework as late. In other words, please do your best to get hard copies of your assignments to me on time. **Please staple all submissions as pages of loose homework often become lost. Neither I nor the grader will accept responsibility for any lost pages if the homework is not stapled.**

Exams: There will be three in-class exams. Coverage includes lecture material, assigned reading, and homework. Tentative dates are provided on the weekly lesson plan. Statistical tables will be provided as needed. Calculators may be used, but no communication devices are allowed (e.g. mobile phones). Make-up exams require a valid excuse and official proof if the instructor is not notified in advance or as soon as possible. A make-up exam must be taken within a week of the missed exam. Exceptions to this policy are permitted only in extreme situations such as serious injury immediately prior to an exam or severe illness requiring hospitalization.

Computing: We will be using the JMP statistical computing software, which is available free of charge to students (see <https://ocio.osu.edu/software/software-request-instructions>).

Attendance: Regular attendance and class participation is required. Please let the instructor know via email if you plan to miss several lectures. Though attendance will not be taken daily, please remember that I fully am aware of which students consistently miss class.

Grading: In order to obtain full credit on homework and exam problems you need to show a justification or full work. Answers without supporting work will not receive full credit. The following is a breakdown of the final course grade:

Homework*: 25%
Exam 1: 25%
Exam 2: 25%
Final Exam: 25%

*The lowest homework grade will be dropped at the end of the semester. The following rubric will be used to compute the final letter grade: A: 93 – 100, A-: 90 – 92.9, B+: 87– 89.9: B: 83 – 86.9, B-: 80-82.9, C+: 77-79.9, C: 73 – 76.9, C-: 70–72.9, D+: 67 – 69.9, D: 60–66.9, E: below 60. The instructor reserves the right to make appropriate changes to the above scale if necessary. However, as usual there are no exceptions nor arbitrary grade adjustments for individual students, nor grade guarantees of any kind, for any reason.

Special Considerations: If a situation exists or arises that you think may hinder your progress in this class, you must notify me as soon as possible.

Advising: For questions related to prerequisites and course suggestions, please contact the Statis-

tics undergraduate advisor Jim Kilburg (614-292-6961, kilburg.3@osu.edu)

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/>.

Disability Services: The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Mental Health Statement: As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student’s ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life’s Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org.