Term Information

Effective Term	Summer 2021
Previous Value	*Autumn 2016*

Course Change Information

What change is being proposed? (If more than one, what changes are being proposed?)

To add a 100% DL option.

What is the rationale for the proposed change(s)?

To give flexibility to offer the course online.

What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course)?

None

Is approval of the requrest contingent upon the approval of other course or curricular program request? No

Is this a request to withdraw the course? No

General Information

Course Bulletin Listing/Subject Area	Statistics
Fiscal Unit/Academic Org	Statistics - D0694
College/Academic Group	Arts and Sciences
Level/Career	Graduate, Undergraduate
Course Number/Catalog	5301
Course Title	Intermediate Data Analysis I
Transcript Abbreviation	Inter Data Anl 1
Course Description	The first course in a two-semester non-calculus sequence in data analysis covering descriptive statistics, design of experiments, probability, statistical inference, one-sample t, goodness of fit, two sample problem, and one-way ANOVA.
Semester Credit Hours/Units	Fixed: 4

Offering Information

Length Of Course	14 Week, 12 Week, 8 Week, 7 Week, 6 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	Yes
Is any section of the course offered	100% at a distance
Previous Value	*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: Math 1075 or equiv, or Math Placement Level of R, or permission of instructor.
Previous Value	*Prereq: Math 1075 (104) or equiv, or Math Placement Level of R, or permission of instructor.*
Exclusions	Not open to students with credit for 5302.
Previous Value	Not open to students with credit for 5301 (528 and 529), or 5302 (529 and 530).
Electronically Enforced	No

Cross-Listings

Cross-Listings

Subject/CIP Code

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

Requirement/Elective Designation

Required for this unit's degrees, majors, and/or minors
General Education course:
    Data Analysis
The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes	• Students understand basic concepts of statistics and probability.
	• Students comprehend methods needed to analyze and critically evaluate statistical arguments.
	• Students recognize the importance of statistical ideas.
Content Topic List	• Graphical/ numerical summaries for data
	• Design of experiments and sampling designs
	• Probability
	• Sampling distributions (sample mean/proportion)
	• Statistical inference (confidence interval, significance test) for population mean/proportion
	• One-sample t procedures
	• Power calculations
	• Contingency tables, chi-square tests , goodness of fit
	• Two sample problem (additive model, randomization test, pooled/non-pooled two-sample t procedures, rank sum test)
	• One-way ANOVA (full and reduced models, multiple comparisons)
Sought Concurrence	No

Attachments

- 5301 Online Syllabus.docx: Online syllabus

  (Syllabus. Owner: Craigmile,Peter F)

- 5301 In Person Syllabus.docx: In-person syllabus

  (Syllabus. Owner: Craigmile,Peter F)

- Stat 5301_DL.docx: ASCTech DL review

  (Other Supporting Documentation. Owner: Craigmile,Peter F)

Comments

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Craigmile,Peter F	12/07/2020 09:33 AM	Submitted for Approval
Approved	Craigmile,Peter F	12/07/2020 09:45 AM	Unit Approval
Approved	Haddad,Deborah Moore	12/07/2020 10:31 AM	College Approval
Pending Approval	Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Oldroyd,Shelby Quinn Vankeerbergen,Bernadette Chantal	12/07/2020 10:31 AM	ASCCAO Approval

SYLLABUS: STAT 5301 – DISTANCE LEARNING
INTERMEDIATE DATA ANALYSIS I
AUTUMN 2021

Course overview

Instructor

Instructor: TBD
Email address: TBD
Class website: TBD
Lectures: On CarmenZoom, Wednesday and Friday, 8:00–9.50 am (About half of these lectures will be presented asynchronously; see *Course delivery* below). There is no class on October 15 (Autumn break).
Office hours: Virtual Hours via CarmenZoom: TBD. The instructor will also be available to answer any questions via CarmenZoom during class periods scheduled for asynchronous instruction and by appointment.

Grader

To be announced

Course description

Statistics 5301 is a first course in a two-semester non-calculus sequence in data analysis covering descriptive statistics, design of experiments, probability, statistical inference, one-sample t, goodness of fit, the two-sample problem, and one-way ANOVA.

Prerequisites: The sequence is intended for students with ``limited'' formal mathematics background (a solid grounding in high school algebra is beneficial). However, in terms of data analysis and interpretation, the conceptual level of the course is high. While many of the students in the course are graduate students (it is a required course in many programs), it is certainly an appropriate sequence for junior and senior level undergraduates.

Course learning outcomes

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

- understand basic concepts of statistics and probability
- comprehend methods needed to analyze and critically evaluate statistical arguments
- recognize the importance of statistical ideas.

GE Course Information

- This course satisfies the General Education (GE) requirement in **Data Analysis**

- **The GE learning outcomes** for the Data Analysis category are to enable students to deal with problems of data-gathering, presentation, and interpretation. Students should develop an understanding of problems of measurement, be able to deal critically with numerical and graphical arguments, gain an understanding of the impact of statistical ideas in daily life and specific areas of study, and recognize the uses and misuses of statistics and related quantitative arguments. Courses should include exposure to fundamental ideas of probability, involve the use of computer programs in problems of data analysis, and include opportunities to present data using summary measures and graphical techniques.

- The course objectives **address the GE learning outcomes** as follows:

  Students in Statistics 5301 are expected to be able to identify an appropriate analysis for data collected in a study, carry out such an analysis, examine whether the assumptions behind the analysis are reasonable, and recognize the strengths or weaknesses of the study based on how the data were collected. Doing so requires understanding basic concepts in statistics and probability; the ability to create graphical and numerical summaries of data; understanding how the design of a study affects the conclusions that can be made; and the ability to carry out basic statistical analyses (by hand or using statistical software). Students will conduct analyses of data, including a discussion (in plain English) of what conclusions can be drawn.

  The goal of statistics is not calculation but gaining understanding from numbers. This means that the correct numerical answer will only receive partial credit. The remainder of the credit will be available for choosing the best method of solution and explaining why the method is appropriate. You will also need to interpret your answers in the light of the practical problem.

Course materials

Required

[SS] *The Statistical Sleuth: A Course in Methods of Data Analysis*, 3rd Edition, by F. Ramsey and D. Schafer, 2013
(electronic version available through CarmenBooks:
https://affordablelearning.osu.edu/carmenbooks-courses-autumn-2020)

Note: *The Statistical Sleuth* is also required for Stat 5302.

Optional materials

There is no required textbook for the first half of the course. You may find the following book useful, but it is optional.

[IPS] *Introduction to the Practice of Statistics* (5th Edition onwards) by D.S. Moore and G.P. McCabe

I will highlight other useful references as the course progresses.

Course technology

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at https://ocio.osu.edu/help/hours, and support for urgent issues is available 24x7.

- **Self-Service and Chat support:** http://ocio.osu.edu/selfservice
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

Baseline technical skills necessary for online courses

- Basic computer and web-browsing skills
- Navigating Carmen

Technology skills necessary for this specific course

- CarmenZoom

Necessary equipment

- Computer: current Mac (OS X) or PC (Windows 10+) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed

- Microphone: built-in laptop or tablet mic or external microphone

Necessary software

- This class requires you to use the statistical software package called R (The R Project for Statistical Computing; http://www.r-project.org/). This software package is available as Free Software.
  - o You can download R for Windows, Mac, and Linux, from the CRAN archive at https://cran.r-project.org.
  - o An in-depth introduction to R is available at http://cran.r-project.org/doc/manuals/R-intro.pdf
  - o Hands-on tutorials are available in the Swirl system, which you can learn about at http://swirlstats.com/. In particular, "R Programming: The basics of programming in R" is an appropriate first tutorial for students who have never used R.
- An easier to use interface to R is available in the software package RStudio. This package is available for Windows, Mac, and Linux and can be downloaded for free from http://rstudio.org. **Note that RStudio requires R to be installed.**
- More details will be given in live or recorded lectures and on the class web site.
- Microsoft Office 365 ProPlus All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Each student can install Office on five PCs or Macs, five tablets (Windows, iPad® and Android™) and five phones.
  - o Students are able to access Word, Excel, PowerPoint, Outlook and other programs, depending on platform. Users will also receive 1 TB of OneDrive for Business storage.
  - o Office 365 is installed within your BuckeyeMail account. Full instructions for downloading and installation can be found https://ocio.osu.edu/kb04733.

Course delivery

The course will consist of a mix of synchronous and asynchronous content. About half of the class periods (one day a week) will be devoted to asynchronous instruction. The remaining class periods (the other day of the week) will be devoted to synchronous instruction and activities that require direct student participation.

Synchronous content will be presented live over CarmenZoom, and asynchronous content will be delivered by recorded lectures posted on the class website. Short quizzes will be administered each week to test the asynchronous material covered during that week. **Details of the weekly schedule will be announced at the start of each week.**

Each week we will cover approximately 220 minutes of content in total. You will be responsible for watching any live content or recorded videos and studying the material that is assigned. In

addition to the lecture videos, assignments will be posted on the class website. You will be given ample time to complete the assignments. The instructor will hold weekly office hours via CarmenZoom according to the schedule given above.

Grading and faculty response

Grades

Assignment or category	Percentage
Quizzes	15
Homework	15
Midterm 1	20
Midterm 2	20
Final Exam	30
Total	100

Grades will be recorded on the class website.

Homework: There will be regular homework assignments (about 10). Homework must be **uploaded to Carmen** at the beginning of class on the day it is due. Homework is **not** accepted by email. Late homework is not accepted, but the lowest homework score will be dropped. You are encouraged to work together on the homework, but do not copy any part of a homework. Each student must produce his/her own homework to be handed in.

Feel free to ask me for help after you have attempted the questions. The grader for the course does not have the time to provide detailed explanations on each question. To make up for this, I will try to prepare homework solutions detailed enough to allow you to understand how the question could be approached. Homework solutions will be available on the class web site.

Homework preparation rules: Homework may be uploaded to Carmen in PDF or Word format. PDF scans of handwritten pages are acceptable. Put your name and the homework assignment number at the top of the first page. Number all pages consecutively. Submit the problems in order, **making sure that the computer output and discussion are placed together** (do not put the computer output at the end of the homework). Include both R code and output in your homework and make it clear what parts of the output are relevant and show how they answer the questions posed in the homework.

Quizzes: Short quizzes will be given each week to assess understanding of the material covered asynchronously.

Exams: There will be two midterms and one final exam:

Midterm 1	Fri Sep 27	8:00–9:50 am
Midterm 2	Fri Nov 5	8:00–9:50 am
Final	TBA	8.00– 9.45 am

All exams are **closed book/closed notes** (except for the sheet of notes described next) and will be **proctored online** – there are no make-up exams. You may use one 8.5x11 inch sheet of paper (both sides), with whatever facts, formulas, or explanations you find helpful, for each exam. Further details will be given in advance of each exam. A basic calculator is allowed – tablets, laptops, cellphones, and other communication devices are not. Statistical tables will be provided as needed.

The first midterm covers the material up to and including Wed Sep 25.
The second midterm covers the material up to and including Wed Nov 3.
The final will cover all the material for the course.

Faculty feedback and response time

I am providing the following list to give you an idea of my intended availability throughout the course. (Remember that you can call **614-688-HELP** at any time if you have a technical problem.)

Grading and feedback

For large weekly assignments, you can generally expect feedback within **7-10 days**.

E-mail

I will reply to e-mails within **24 hours on school days**.

Attendance, participation, and discussions

Students may miss class, for a variety of reasons related to COVID-19. As much as possible, please stay in contact with the instructor so that we can discuss accommodations should they be needed.

Student participation requirements

Because this is a distance-education course, your attendance is based on your online activity and participation. The following is a summary of everyone's expected participation:

- **In live lectures:**

  Students will be expected to participate, discuss, and answer questions in online live lectures.

- **Logging in: AT LEAST THREE TIMES PER WEEK**

  Be sure you are logging in to the course in Carmen each week, including weeks with holidays. (During most weeks you will probably log in many times.) If you encounter a situation that might cause you to miss an entire week of class, discuss it with me as soon as possible.

- **Office hours: OPTIONAL OR FLEXIBLE**

  All office hours are optional. If you are wish to discuss an assignment with me, please contact me at the beginning of the week if you need a time outside my scheduled office hours.

Discussion and communication guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style**: While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. Informality (including an occasional emoticon) is fine for non-academic topics.

- **Tone and civility**: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online.

- **Citing your sources**: When we have academic discussions, please cite your sources to back up what you say. (For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.)

- **Backing up your work**: Consider composing your academic posts in a text editor or word processor, where you can save your work, and then copying into the Carmen discussion.

Other course policies

Health and safety

The Ohio State University Wexner Medical Center's Cornavirus Outbreak site (https://wexnermedical.osu.edu/features/coronavirus) includes the latest information about

COVID-19 as well as guidance for students, faculty and staff. Guidelines and requirements for campus safety from the University's COVID-19 Transition Task Force were published on July 1 on the Safe and Healthy website (https://safeandhealthy.osu.edu).

Potential disruptions to instruction

- As much as possible, students will have access to material online if they are unable to attend class because of positive diagnosis, symptoms, or quarantine required following contact tracing.
- If the instructor is unable to be present in person because of positive diagnosis, symptoms, or quarantine following contact tracing a new instructor will be assigned to the course. Details will be given on the course website.

Student academic services

Student academic services offered on the OSU main campus http://advising.osu.edu/welcome.shtml.

Student support services

Student support services offered on the OSU main campus http://ssc.osu.edu.

Academic integrity policy

Policies for this online course

- **Quizzes and exams**: You must complete the quizzes, midterm, and final exams yourself, without any external help or communication.
- **Written assignments**: Your written assignments, including discussion posts, should be your own original work.
- **Reusing past work**: In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.
- **Falsifying research or results**: All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your library research look more successful than it was.
- **Collaboration and informal peer-review**: The course includes many opportunities for formal collaboration with your classmates. While study groups and peer-review of major written projects is encouraged, remember that comparing answers on a quiz or

assignment is not permitted. If you're unsure about a particular situation, please feel free just to ask ahead of time.

Ohio State's academic integrity policy

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/.

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Statement on title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at http://titleix.osu.edu or by contacting the Ohio State Title IX Coordinator, at titleix@osu.edu

Accessibility accommodations for students with disabilities

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.

Accessibility of course technology

This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- [Carmen (Canvas) accessibility](#)
- Streaming audio and video
- Synchronous course tools

Your mental health

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

Disclaimer

This syllabus should be taken as a fairly reliable guide for the course content. However, you cannot claim any rights from it and in particular we reserve the right to change due dates or the methods of grading and/or assessment if necessary. Any changes will be communicated to you through official course announcements.

Course schedule (tentative)

Week	Dates	Topics, Readings, Assignments, Deadlines
1	Aug 25, 27	Data, graphical and numerical summaries. IPS 1.1-1.3
2	Sep 1, 3	Scatterplots, correlation, data sources, design, drawing statistical conclusions IPS 2.1-2.3, 3.1-3.2; SS 1
3	Sep 8, 10	Sampling design, randomness, probability models IPS 3.3, 4.1-4.2
4	Sep 15, 17	Random variables, mean and variance IPS 4.3-4.4 Review
5	Sep 22, 24	Sampling distribution of a sample mean and of a sampling proportion IPS 5 Midterm 1 on Sep 22
6	Sep 29, Oct 1	Confidence Intervals, Hypothesis Testing, Power and Inference as a Decision, Use and Abuse of Tests IPS 6.1-6.4
7	Oct 6, 8	One Sample t-tools, The Sign Test, One-Sided and Two-Sided Tests, (Pooled) Two-Sample t-tools, IPS 7.1-7.2; SS 2

8	Oct 13 Oct 15 (Break)	Assumptions of the t-tools, Variable transformations SS 3
9	Oct 20, 22	non-pooled t-tools, the Rank Sum Test SS 4
10	Oct 27, 29	Wilcoxon Signed-Rank Test SS 4.4 Review
11	Nov 3, 5	Inference for a population proportion, Comparing two proportions IPS 8, SS 18.1-18.2 Midterm 2
12	Nov 10, 12	ANOVA Introduction SS 5
13	Nov 17, 19	Inferences about Linear Combinations of Group Means SS 6.1-6.2
14	Nov 24, 26	Simultaneous Inferences SS 6.3-6.4
15	Dec 1, 3	Model Comparison with the F-test
16	Dec 8	Review

THE OHIO STATE UNIVERSITY

COLLEGE OF ARTS AND SCIENCES

SYLLABUS: STAT 5301 – IN-PERSON
INTERMEDIATE DATA ANALYSIS I
AUTUMN 2021

Course overview

Instructor

Instructor: TBD
Email address: TBD
Class website: TBD
Lectures: Wednesday and Friday, 8:00–9.50
Office hours: TBD and by appointment.

Grader

To be announced

Course description

Statistics 5301 is a first course in a two-semester non-calculus sequence in data analysis covering descriptive statistics, design of experiments, probability, statistical inference, one-sample t, goodness of fit, the two-sample problem, and one-way ANOVA.

Prerequisites: The sequence is intended for students with ``limited'' formal mathematics background (a solid grounding in high school algebra is beneficial). However, in terms of data analysis and interpretation, the conceptual level of the course is high. While many of the students in the course are graduate students (it is a required course in many programs), it is certainly an appropriate sequence for junior and senior level undergraduates.

Course learning outcomes

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

- understand basic concepts of statistics and probability
- comprehend methods needed to analyze and critically evaluate statistical arguments
- recognize the importance of statistical ideas.

GE Course Information

- This course satisfies the General Education (GE) requirement in **Data Analysis**

- **The GE learning outcomes** for the Data Analysis category are to enable students to deal with problems of data-gathering, presentation, and interpretation. Students should develop an understanding of problems of measurement, be able to deal critically with numerical and graphical arguments, gain an understanding of the impact of statistical ideas in daily life and specific areas of study, and recognize the uses and misuses of statistics and related quantitative arguments. Courses should include exposure to fundamental ideas of probability, involve the use of computer programs in problems of data analysis, and include opportunities to present data using summary measures and graphical techniques.

- The course objectives **address the GE learning outcomes** as follows:

  Students in Statistics 5301 are expected to be able to identify an appropriate analysis for data collected in a study, carry out such an analysis, examine whether the assumptions behind the analysis are reasonable, and recognize the strengths or weaknesses of the study based on how the data were collected. Doing so requires understanding basic concepts in statistics and probability; the ability to create graphical and numerical summaries of data; understanding how the design of a study affects the conclusions that can be made; and the ability to carry out basic statistical analyses (by hand or using statistical software). Students will conduct analyses of data, including a discussion (in plain English) of what conclusions can be drawn.

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Course materials

Required

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Note: *The Statistical Sleuth* is also required for Stat 5302.

Optional materials

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I will highlight other useful references as the course progresses.

Course technology

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Baseline technical skills necessary for the course

- Basic computer and web-browsing skills
- Navigating Carmen

Necessary equipment

- Computer: current Mac (OS X) or PC (Windows 10+) with high-speed internet connection

Necessary software

- This class requires you to use the statistical software package called R (The R Project for Statistical Computing; http://www.r-project.org/). This software package is available as Free Software.
  - You can download R for Windows, Mac, and Linux, from the CRAN archive at https://cran.r-project.org.
  - An in-depth introduction to R is available at http://cran.r-project.org/doc/manuals/R-intro.pdf
  - Hands-on tutorials are available in the Swirl system, which you can learn about at http://swirlstats.com/. In particular, "R Programming: The basics of

programming in R" is an appropriate first tutorial for students who have never used R.

- An easier to use interface to R is available in the software package RStudio. This package is available for Windows, Mac, and Linux and can be downloaded for free from http://rstudio.org. **Note that RStudio requires R to be installed.**
- More details will be given in live or recorded lectures and on the class web site.
- Microsoft Office 365 ProPlus All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Each student can install Office on five PCs or Macs, five tablets (Windows, iPad® and Android™) and five phones.
  - o Students are able to access Word, Excel, PowerPoint, Outlook and other programs, depending on platform. Users will also receive 1 TB of OneDrive for Business storage.
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Grading and faculty response

Grades

Assignment or category	Percentage
Homework	20
Midterm 1	25
Midterm 2	25
Final Exam	30
Total	100

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Homework: There will be regular homework assignments (about 10). Homework must be **uploaded to Carmen** at the beginning of class on the day it is due. Homework is **not** accepted by email. Late homework is not accepted, but the lowest homework score will be dropped. You are encouraged to work together on the homework, but do not copy any part of a homework. Each student must produce his/her own homework to be handed in.

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Exams: There will be two midterms and one final exam:

Midterm 1	Fri Sep 27	8:00–9:50 am
Midterm 2	Fri Nov 5	8:00–9:50 am
Final	TBA	8.00– 9.45 am

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The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style**: While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. Informality (including an occasional emoticon) is fine for non-academic topics.
- **Tone and civility**: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably.
- **Citing your sources**: When we have academic discussions, please cite your sources to back up what you say. (For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.)
- **Backing up your work**: Consider composing your academic posts in a text editor or word processor, where you can save your work, and then copying into the Carmen discussion.

Other course policies

Health and safety

The Ohio State University Wexner Medical Center's Cornavirus Outbreak site (https://wexnermedical.osu.edu/features/coronavirus) includes the latest information about COVID-19 as well as guidance for students, faculty and staff. Guidelines and requirements for campus safety from the University's COVID-19 Transition Task Force were published on July 1 on the Safe and Healthy website (https://safeandhealthy.osu.edu).

Student academic services

Student academic services offered on the OSU main campus http://advising.osu.edu/welcome.shtml.

Student support services

Student support services offered on the OSU main campus http://ssc.osu.edu.

Academic integrity policy

Policies for this course

- **Exams**
  You must complete the midterms and final exams yourself, without any external help or communication.
- **Written assignments**: Your written assignments, including discussion posts, should be your own original work.
- **Reusing past work**: In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.
- **Falsifying research or results**: All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your library research look more successful than it was.
- **Collaboration and informal peer-review**: The course includes many opportunities for formal collaboration with your classmates. While study groups and peer-review of major written projects is encouraged, remember that comparing answers on a quiz or assignment is not permitted. If you're unsure about a particular situation, please feel free just to ask ahead of time.

Ohio State's academic integrity policy

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/.

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Statement on title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to

offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at http://titleix.osu.edu or by contacting the Ohio State Title IX Coordinator, at titleix@osu.edu

Accessibility accommodations for students with disabilities

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.

Accessibility of course technology

This course requires use of Carmen (Ohio State's learning management system). If you need additional services to use these technologies, please request accommodations with your instructor.

- Carmen (Canvas) accessibility

Your mental health

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

Disclaimer

This syllabus should be taken as a fairly reliable guide for the course content. However, you cannot claim any rights from it and in particular we reserve the right to change due dates or the methods of grading and/or assessment if necessary. Any changes will be communicated to you through official course announcements.

Course schedule (tentative)

Week	Dates	Topics, Readings, Assignments, Deadlines
1	Aug 25, 27	Data, graphical and numerical summaries. IPS 1.1-1.3
2	Sep 1, 3	Scatterplots, correlation, data sources, design, drawing statistical conclusions IPS 2.1-2.3, 3.1-3.2; SS 1
3	Sep 8, 10	Sampling design, randomness, probability models IPS 3.3, 4.1-4.2
4	Sep 15, 17	Random variables, mean and variance IPS 4.3-4.4 Review
5	Sep 22, 24	Sampling distribution of a sample mean and of a sampling proportion IPS 5 Midterm 1 on Sep 22
6	Sep 29, Oct 1	Confidence Intervals, Hypothesis Testing, Power and Inference as a Decision, Use and Abuse of Tests IPS 6.1-6.4
7	Oct 6, 8	One Sample t-tools, The Sign Test, One-Sided and Two-Sided Tests, (Pooled) Two-Sample t-tools, IPS 7.1-7.2; SS 2

8	Oct 13 Oct 15 (Break)	Assumptions of the t-tools, Variable transformations SS 3
9	Oct 20, 22	non-pooled t-tools, the Rank Sum Test SS 4
10	Oct 27, 29	Wilcoxon Signed-Rank Test SS 4.4 Review
11	Nov 3, 5	Inference for a population proportion, Comparing two proportions IPS 8, SS 18.1-18.2 Midterm 2
12	Nov 10, 12	ANOVA Introduction SS 5
13	Nov 17, 19	Inferences about Linear Combinations of Group Means SS 6.1-6.2
14	Nov 24, 26	Simultaneous Inferences SS 6.3-6.4
15	Dec 1, 3	Model Comparison with the F-test
16	Dec 8	Review

Arts and Sciences Distance Learning Course Component Technical Review Checklist

Course: STAT 5302
Instructor: TBD
Summary: Intermediate Data Analysis I

Standard - Course Technology	Yes	Yes with Revisions	No	Feedback/ Recomm.
6.1 The tools used in the course support the learning objectives and competencies.	X			• Carmen • Office 365 • R Software
6.2 Course tools promote learner engagement and active learning.	X			• Zoom lectures • Carmen Discussion boards
6.3 Technologies required in the course are readily obtainable.	X			All are available within Carmen which is free to use.
6.4 The course technologies are current.	X			All items are updated regularly.
6.5 Links are provided to privacy policies for all external tools required in the course.	X			All available privacy policies are included.
Standard - Learner Support				
7.1 The course instructions articulate or link to a clear description of the technical support offered and how to access it.	X			Links to 8HELP are provided, as is a link to R software support.
7.2 Course instructions articulate or link to the institution's accessibility policies and services.	X			a
7.3 Course instructions articulate or link to an explanation of how the institution's academic support services and resources can help learners succeed in the course and how learners can obtain them.	X			b
7.4 Course instructions articulate or link to an explanation of how the institution's student services and resources can help learners succeed and how learners can obtain them.	X			c
Standard – Accessibility and Usability				
8.1 Course navigation facilitates ease of use.	X			Recommend using the Carmen Distance Learning "Master Course" template developed by ODEE and available in the Canvas Commons to provide student-users with a consistent user experience in terms of navigation and access to course content.
8.2 Information is provided about the accessibility of all technologies required in the course.	X			All available accessibility policies are included.
8.3 The course provides alternative means of access to course materials in formats that meet the needs of diverse learners.	X			
8.4 The course design facilitates readability	X			
8.5 Course multimedia facilitate ease of use.	X			All assignments and activities that use the Carmen LMS with embedded multimedia facilitates ease of use. All other multimedia resources facilitate ease of use by being available through a standard web browser

Reviewer Information
- Date reviewed: 12/7/2020
- Reviewed by: Ian Anderson

Notes: Good to go!

[a]The following statement about disability services (recommended 16 point font): 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.

[b]Add to the syllabus this link with an overview and contact information for the student academic services offered on the OSU main campus. http://advising.osu.edu/welcome.shtml

[c]Add to the syllabus this link with an overview and contact information for student services offered on the OSU main campus. http://ssc.osu.edu. Also, consider including this link in the "Other Course Policies" section of the syllabus.