

Term Information

Effective Term Summer 2021
Previous Value Summer 2012

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 request 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
Course Number/Catalog	6450
Course Title	Applied Regression Analysis
Transcript Abbreviation	Appl Regress Anl
Course Description	Simple and multiple linear regression, diagnostics, model selection, models with categorical variables.
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
<i>Previous Value</i>	<i>No</i>
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: 6201, or equiv, or permission of instructor.
Previous Value	Prereq: 6201 (521), or equiv, or permission of instructor.
Exclusions	Not open to students with credit for 6950.
Previous Value	Not open to students with credit for 6950 (645).
Electronically Enforced	No

Cross-Listings

Cross-Listings

Subject/CIP Code

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

Requirement/Elective Designation

Required for this unit's degrees, majors, and/or minors
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	<ul style="list-style-type: none">• Understand the motivation of regression analysis• Understand the theoretical assumptions behind the linear model and their importance in properly conducting a regression analysis• Know how to estimate the parameters in regression models• Be able to validate the modeling assumptions with formal tests and visual diagnostic tools• Know how to make inferences regarding the linear model• Be able to build and validate regression models in a principled manner• Be able to apply the above knowledge and techniques in on your own data or problems
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[Previous Value](#)

Content Topic List	<ul style="list-style-type: none">• Simple linear regression (SLR) model• Statistical methodology for fitting an SLR model• Statistical inferences in regression analysis• Diagnostics for checking SLR model assumptions and remedies• Matrix approach to SLR analysis• Multiple linear regression (MLR) model• Statistical methodology for fitting an MLR model• Indicator variables for qualitative predictors• Diagnostics for checking MLR model assumptions• Model building and model selection• Nonlinear models; logistic regression
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COURSE CHANGE REQUEST
6450 - Status: PENDING

Last Updated: Haddad,Deborah Moore
12/07/2020

Sought Concurrence

No

Attachments

- 6450 Online Syllabus.docx: Online syllabus
(Syllabus. Owner: Craigmile,Peter F)
- 6450 In-Person Syllabus.docx: In-person syllabus
(Syllabus. Owner: Craigmile,Peter F)
- Stat 6450_DL.docx: ASCTech DL review
(Other Supporting Documentation. Owner: Craigmile,Peter F)

Comments

- 12.07.20: I change the "no" for distance ed component to "yes". *(by Haddad,Deborah Moore on 12/07/2020 10:30 AM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Craigmile,Peter F	12/07/2020 09:40 AM	Submitted for Approval
Approved	Craigmile,Peter F	12/07/2020 09:47 AM	Unit Approval
Approved	Haddad,Deborah Moore	12/07/2020 10:30 AM	College Approval
Pending Approval	Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Oldroyd,Shelby Quinn Vankeerbergen,Bernadette Chantal	12/07/2020 10:30 AM	ASCCAO Approval



THE OHIO STATE UNIVERSITY

COLLEGE OF ARTS AND SCIENCES

SYLLABUS: STAT 6450 – DISTANCE LEARNING APPLIED REGRESSION ANALYSIS AUTUMN 2021

Course overview

Instructor

Instructor: Subhadeep Paul

Email address: paul.963@osu.edu

Lectures: On CarmenZoom, Tuesday and Thursdays, 9:05–10:55 am.

There are no classes on October 14 (Autumn break) or November 11 (Veterans day)

Office hours: Virtual Hours via Carmen Zoom (Tuesday 11:30-12:30, Thursday 11:30-12:30)

Grader or Teaching Assistant

To be announced.

Course description

Statistics 6450 is intended to be an introduction to regression analysis techniques. Its focus will be on the application of linear regression models in practice but will also cover basic theory of the linear model. Topics of Stat 6450 include:

Simple Linear Regression (SLR) model

- Methodology for fitting models
- Statistical inference
- Diagnostics for verification of assumptions and their remedies

Multiple Linear Regression (MLR) model

- Methodology for fitting models and use of matrix algebra
- Statistical inference
- Binary indicator (1/0) and qualitative predictors
- Diagnostic measures of model fit
- Variable selection and model building

Generalized Linear Models (GLMs)

- Logistic regression
- Additional topics as time permits (may include high dimensional regression, Poisson regression)

Prerequisite or corequisite:

Statistics 6201 or equivalent.

Course learning outcomes

By the end of this course, students should successfully be able to:

- Understand the motivation of regression analysis
- Understand the theoretical assumptions behind the linear model and their importance in properly conducting a regression analysis
- Know how to estimate the parameters in regression models
- Be able to validate the modeling assumptions with formal tests and visual diagnostic tools
- Know how to make inferences regarding the linear model
- Be able to build and validate regression models in a principled manner
- Be able to apply the above knowledge and techniques in on your own data or problems

Course materials

Required

The required textbook for this course is:

Applied Linear Regression Models, 4th edition, by Kutner, Nachtsheim, and Neter. (print)

Optional materials

A related text book (not required)

Applied Regression Analysis, Wiley. Normal Draper and Harry Smith (1998). (print)

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
- Recording a slide presentation with audio narration
- Recording, editing, and uploading video

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.
 - 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.**
- [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.
 - 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.
 - 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 be primarily delivered synchronously with some occasional asynchronous content. Synchronous content will be presented live over CarmenZoom during the lecture times (see above), and asynchronous content (if any) will be delivered by recorded lectures posted on the class website in carmen.

Each week we will cover approximately 220 minutes of content in total. You will be responsible for attending live virtual classes and watching any recorded videos as well as 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. The times are given above.

Grading and faculty response

Grades

Assignment or category	Percentage
Homework	35
Midterm Exam	20
Final Exam	25
Final Project	20
Total	100

Assignment information

Homework: Homework will be assigned regularly (a total of 5 homework assignments). It will consist of both written problems and computer programming/data analysis problems. You are encouraged to work together on the problems, but each student must hand in their own work, written in their own words. Do not copy any part of another student's homework including computer 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. **All homework must be submitted online as a PDF file through the class website (Carmen).** Please be sure that the questions are clearly labeled, all supporting work (including computer code) can be easily identified, and that all figures/tables are referenced and interpreted in the text.

Please note late submission of assignments will not be accepted unless prior exception has been sought. if you are unable to complete an assignment on time, please get in touch with me as soon as possible so we can discuss your situation

Exams: There will be two exams --**one midterm exam and a final exam.** Coverage includes lecture material, assigned reading, and homework. All exams are closed book/closed notes and will be delivered through carmen and proctored online through CarmenZoom. Further details will be given in advance of each exam.

Tentative Date for midterm exam: Tuesday, October 12, 2020 during class time.
Final Exam Date (University scheduled): TBD

Statistical tables will be provided as needed. Calculators may be used, but no communication devices are allowed (e.g. mobile phones). Makeup exams require a valid excuse and official proof if I am notified in advance or as soon as possible.

Project: A data-analysis group class project will consist of an oral presentation of results obtained from analyzing a dataset, and will require use of the R software. The students are expected to work in groups of 3-5 and each group can select a dataset of their choice to analyze (preferably from the research/educational domain of the students to bring more diversity of topics). No written report is required. **The groups will present their results to the class on Dec 2 during the usual class time.**

Grading scale

93–100: A
90–92.9: A-
87–89.9: B+
83–86.9: B
80–82.9: B-
77–79.9: C+
73–76.9: C
70–72.9: C-
67–69.9: D+
60–66.9: D
Below 60: E

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 **14 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:

- **Logging in: AT LEAST ONCE PER WEEK**
Be sure you are logging in to the course in Carmen each week, including weeks with holidays or weeks with minimal online course activity. (During most weeks you will probably log in many times.) If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible*.
- **In live lectures:** Students will be expected to participate, discuss, and answer questions in online live lectures.
- **Office hours: OPTIONAL OR FLEXIBLE**
All office hours, are optional. If you are required 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 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 Coronavirus 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 is 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

- **Exams:** You must complete the 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 assignments is not permitted. If you're unsure about a particular situation, please feel free just to ask ahead of time.
- **Group projects:** This course includes group projects, which can be stressful for students when it comes to dividing work, taking credit, and receiving grades and feedback. I will make the guidelines for group work as clear as possible for each activity and assignment, but please let me know if you have any questions.

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 24,26	Introduction, background materials, R programming basics
2	Aug 30, Sep 2	Simple Linear Regression (SLR) – parameter estimation and inference
3	Sep 7, 9	SLR – inference on model and ANOVA, visual diagnostics
4	Sep 14, 16	SLR- diagnostic tools, remedies, transformations, simultaneous inference
5	Sep 21, 23	Recap of linear algebra and SLR in matrix form
6	Sep 28, 30	Multiple Linear Regression (MLR) –introduction and estimation, models with interactions
7	Oct 5, 7	MLR – inference, diagnostics and remedy, general linear test
8	Oct 12	Midterm Exam
9	Oct 19, 21	Weighted least squares, indicator (dummy) and qualitative predictors,
10	Oct 26, 28	Piecewise linear models, polynomial regression, the bootstrap
11	Nov 2, 4	Variable Selection and Model building (stepwise regression)
12	Nov 9	Bias variance tradeoff, cross validation
13	Nov 16, 18	Lasso, ridge regression, Data Analysis with MLR
14	Nov 23	Generalized Linear Models (GLM) – logistic regression estimation, inference, residuals, diagnostics
15	Nov 30, Dec 2	Logistic regression –model selection, prediction, Data Analysis, Poisson regression
15	Dec 7	Project presentation



THE OHIO STATE UNIVERSITY

COLLEGE OF ARTS AND SCIENCES

SYLLABUS: STAT 6450 – IN-PERSON APPLIED REGRESSION ANALYSIS AUTUMN 2021

Course overview

Instructor

Instructor: Subhadeep Paul

Email address: paul.963@osu.edu

Lectures: Tuesday and Thursdays, 9:05–10:55 am

There are no classes on October 14 (Autumn break) or November 11 (Veterans day)

Office hours: TBA or by appointment

Grader or Teaching Assistant

To be announced.

Course description

Statistics 6450 is intended to be an introduction to regression analysis techniques. Its focus will be on the application of linear regression models in practice but will also cover basic theory of the linear model. Topics of Stat 6450 include:

Simple Linear Regression (SLR) model

- Methodology for fitting models
- Statistical inference
- Diagnostics for verification of assumptions and their remedies

Multiple Linear Regression (MLR) model

- Methodology for fitting models and use of matrix algebra
- Statistical inference
- Binary indicator (1/0) and qualitative predictors
- Diagnostic measures of model fit
- Variable selection and model building

Generalized Linear Models (GLMs)

- Logistic regression
- Additional topics as time permits (may include high dimensional regression, Poisson regression)

Prerequisite or corequisite:

Statistics 6201 or equivalent.

Course learning outcomes

By the end of this course, students should successfully be able to:

- Understand the motivation of regression analysis
- Understand the theoretical assumptions behind the linear model and their importance in properly conducting a regression analysis
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Course materials

Required

The required textbook for this course is:

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Optional materials

A related text book (not required)

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Course technology

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Baseline technical skills necessary

- 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.**
- [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.
 - 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.
 - Office 365 is installed within your BuckeyeMail account. Full instructions for downloading and installation can be found <https://ocio.osu.edu/kb04733>.

Grading and faculty response

Grades

Assignment or category	Percentage
Homework	35
Midterm Exam	20
Final Exam	25
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Assignment information

Homework: Homework will be assigned regularly (a total of 5 homework assignments). It will consist of both written problems and computer programming/data analysis problems. You are encouraged to work together on the problems, but each student must hand in their own work, written in their own words. Do not copy any part of another student's homework including computer 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. **All homework must be submitted online as a PDF file through the class website (Carmen).** Please be sure that the questions are clearly labeled, all supporting work (including computer code) can be easily identified, and that all figures/tables are referenced and interpreted in the text.

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Exams: There will be two exams --**one midterm exam and a final exam.** Coverage includes lecture material, assigned reading, and homework. All exams are closed book/closed notes. Further details will be given in advance of each exam.

Tentative Date for midterm exam: Tuesday, October 12, 2020 during class time.
Final Exam Date (University scheduled): TBD

Statistical tables will be provided as needed. Calculators may be used, but no communication devices are allowed (e.g. mobile phones). Makeup exams require a valid excuse and official proof if I am notified in advance or as soon as possible.

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Grading scale

93–100: A
90–92.9: A-
87–89.9: B+
83–86.9: B
80–82.9: B-
77–79.9: C+
73–76.9: C

70 –72.9: C-
67 –69.9: D+
60 –66.9: D
Below 60: E

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

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Discussion and communication guidelines

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- **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 word processor, where you can save your work, and then copying into the Carmen discussion.

Other course policies

Student academic services

Student academic services offered on the OSU main campus

<http://advising.osu.edu/welcome.shtml>.

Student support services

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Academic integrity policy

Policies for this course

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- **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 assignments is not permitted. If you're unsure about a particular situation, please feel free just to ask ahead of time.
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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 this technology, 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 24,26	Introduction, background materials, R programming basics
2	Aug 30, Sep 2	Simple Linear Regression (SLR) – parameter estimation and inference
3	Sep 7, 9	SLR – inference on model and ANOVA, visual diagnostics
4	Sep 14, 16	SLR- diagnostic tools, remedies, transformations, simultaneous inference
5	Sep 21, 23	Recap of linear algebra and SLR in matrix form
6	Sep 28, 30	Multiple Linear Regression (MLR) –introduction and estimation, models with interactions
7	Oct 5, 7	MLR – inference, diagnostics and remedy, general linear test
8	Oct 12	Midterm Exam
9	Oct 19, 21	Weighted least squares, indicator (dummy) and qualitative predictors,
10	Oct 26, 28	Piecewise linear models, polynomial regression, the bootstrap
11	Nov 2, 4	Variable Selection and Model building (stepwise regression)
12	Nov 9	Bias variance tradeoff, cross validation
13	Nov 16, 18	Lasso, ridge regression, Data Analysis with MLR
14	Nov 23	Generalized Linear Models (GLM) – logistic regression estimation, inference, residuals, diagnostics
15	Nov 30, Dec 2	Logistic regression –model selection, prediction, Data Analysis, Poisson regression
15	Dec 7	Project presentation

Arts and Sciences Distance Learning Course Component Technical Review Checklist

Course: STAT 6450

Instructor: Subhadeep Paul

Summary: Applied Regression Analysis

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			<ul style="list-style-type: none"> Carmen Office 365 R Software
6.2 Course tools promote learner engagement and active learning.	X			<ul style="list-style-type: none"> 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!

^aThe 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.

^bAdd 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>

^cAdd 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.