# Term Information

| | |
|---|---|
| **Effective Term** | Spring 2022 |
| *Previous Value* | *Summer 2012* |

# Course Change Information

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

To allow the course to be offered 100% online

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

To allow the course to be offered 100% 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** | 7430 |
| **Course Title** | Generalized Linear Models |
| **Transcript Abbreviation** | Genlzd Lin Models |
| **Course Description** | Introduces the statistical theory and methods to extend regression and analysis of variance to non-normal data. Students will learn to use fixed and random effect generalized linear models to model univariate and multivariate data. |
| **Semester Credit Hours/Units** | Fixed: 3 |

# 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: 6801, 6802, 6910, 6950, and 7410; or permission of instructor. |
| *Previous Value* | *Prereq: 6801 (620 and 621), 6802 (621 and 622), 6910 (641), 6950 (645), and 7410 (742); or permission of instructor.* |
| **Exclusions** | |
| *Previous Value* | Not open to students with credit for 743. |
| **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

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** | • Explain and rigorously derive key aspects of the theory of generalized linear models (GLMs), including the concepts of overdispersion and quasi-likelihood; |
| | • Interpret and use appropriate statistical notation and terminology; |
| | • Independently construct and implement an appropriate statistical analysis involving GLMs to answer a scientific question of interest; |
| | • Express statistical ideas in written English using vocabulary tailored to the audience. |
| *Previous Value* | |
| **Content Topic List** | • Review of generalized linear models (GLMs): form and function |
| | • Parameter estimation and goodness of fit |
| | • Generalized linear models for binary data |
| | • Poisson GLMs |
| | • Multinomial GLMs |
| | • Defining and modeling overdispersion |
| | • Gamma GLMs |
| | • Quasi-likelihood and inference |
| | • Empirical variance estimates |
| | • Generalized linear models for dependent data |
| **Sought Concurrence** | No |

## Attachments

- SP22-STAT-7430-Craigmile_Distance.docx: Distance version

  *(Syllabus. Owner: Craigmile,Peter F)*

- SP20-STAT-7430-Craigmile_In Person.pdf: In person

  *(Syllabus. Owner: Craigmile,Peter F)*

- 7430_asc_distance_approval_cover_sheet_corrected.docx: ASC distance learning checklist

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

- 7430_asc_distance_approval_cover_sheet_corrected USE THIS ONE.docx: USE THIS ONE--ASC DL checklist

  *(Other Supporting Documentation. Owner: Vankeerbergen,Bernadette Chantal)*

## Comments

## Workflow Information

| Status | User(s) | Date/Time | Step |
|---|---|---|---|
| Submitted | Craigmile,Peter F | 06/29/2021 10:45 AM | Submitted for Approval |
| Approved | Craigmile,Peter F | 08/10/2021 02:32 PM | Unit Approval |
| Approved | Vankeerbergen,Bernadette Chantal | 08/13/2021 04:27 PM | College Approval |
| Pending Approval | Cody,Emily Kathryn Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Hilty,Michael Vankeerbergen,Bernadette Chantal Steele,Rachel Lea | 08/13/2021 04:27 PM | ASCCAO Approval |

THE OHIO STATE UNIVERSITY

# STAT 7430

GENERALIZED LINEAR MODELS
Spring 2022
3 credit hours
Online

# COURSE OVERVIEW

## Instructor

Instructor: Peter F. Craigmile

Email address: pfc@stat.osu.edu (preferred contact method)

Office hours: Virtual Hours via Carmen Zoom: TO BE ANNOUNCED, or by appointment

## Course description

Stat 7430 introduces the statistical theory and methods to extend regression and analysis of variance to non-normal data. By the end of the course students should be able to use fixed effect generalized linear models to model data. In particular there will be a focus on model identification, building, diagnostics, and inference. This course covers extensions to longitudinal models.

Prequisites: Stat 6910, 6950 (Applied Statistics I and II) giving exposure to analysis of variance and experimental design, as well as regression modeling – Stat 7410 (Theory of Linear Models) provides the theory for these models. Stat 6801–6802 (Statistical Theory I and II), introducing distribution theory and methods for statistical estimation and testing.

## Course learning outcomes

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

1. Explain and rigorously derive key aspects of the theory of generalized linear models (GLMs), including the concepts of overdispersion and quasi-likelihood;

2. Interpret and use appropriate statistical notation and terminology;

3. Independently construct and implement an appropriate statistical analysis involving GLMs to answer a scientific question of interest;

4. Express statistical ideas in written English using vocabulary tailored to the audience.

# HOW THIS ONLINE COURSE WORKS

**Mode of delivery: The course will be a mix of synchronous and asynchronous content.**
Synchronous content will be presented live over CarmenZoom, and asynchronous content will be delivered by recorded lectures posted on the class website. Each week we will cover approximately 165 minutes of content in total. You will 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. The times are given above.

**Credit hours and work expectations:** This is a **3-credit-hour course**. According to Ohio State policy (go.osu.edu/credithours), students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of (C) average.

**Attendance and 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 have 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 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.

# COURSE MATERIALS AND TECHNOLOGIES

## Textbooks

**Required**

- P. McCullagh and J.A. Nelder (1999), Generalized linear models, second edition, Chapman and Hall/CRC Press, London; New York. (This is a reprint of the 1989 Chapman and Hall book).

I will highlight other useful references as the course progresses.

# Course technology

## Technology support

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the Ohio State IT Service Desk. Standard support hours are available at ocio.osu.edu/help/hours, and support for urgent issues is available 24/7.

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

## Technology skills needed for this course

- Basic computer and web-browsing skills
- Navigating Carmen (go.osu.edu/canvasstudent)
- CarmenZoom virtual meetings (go.osu.edu/zoom-meetings)
- Recording a slide presentation with audio narration (go.osu.edu/video-assignment-guide)
- Recording, editing, and uploading video (go.osu.edu/video-assignment-guide)

## Required equipment

- Computer: current Mac (MacOs) or PC (Windows 10) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone
- Other: a mobile device (smartphone or tablet) to use for BuckeyePass authentication

## Required 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

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 recorded lectures and on the class web site.

## Carmen access

You will need to use BuckeyePass (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions (go.osu.edu/add-device).
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the Duo Mobile application (go.osu.edu/install-duo) to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357(HELP) and IT support staff will work out a solution with you.

# GRADING AND FACULTY RESPONSE

## How your grade is calculated

| ASSIGNMENT CATEGORY | PERCENTAGE |
|---|---|
| Homework | 30 |
| Midterm | 30 |
| Project | 40 |
| Total | **100** |

Grades will be recorded on the class website.

**Homework** will be due at the beginning of class on the day it is due (9.35am). Typically, no late homework will be accepted. However, 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. 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. All homework must be submitted online as a PDF file through the class website. Feel free to ask me for help after you have made an attempt of the questions.

The grader for the course does not have the time to provide detailed explanations on each question that is graded. To make up for this, I will endeavor to create homework solutions that are detailed enough to allow you to understand how the question could be approached.

**Homework preparation rules:** Put your name and the homework assignment number on the top right-hand corner of every page. Submit the problems in order, making sure that the computer output and discussion is placed together (do not put the computer output at the end of homework). Raw computer output is not acceptable. Make it clear what parts of the output are relevant and show how they answer the questions posed in the homework.

**Midterm:** The midterm will be held online on Thu Mar 3 from 9.35–10.55am. The midterm will be **closed book/closed notes** and will be **proctored online**. There is no make-up exam. Further details will be given in advance of the exam. A basic calculator is allowed – tablets, laptops, cellphones, and other communication devices are not. The midterm covers the material up to and including Tue Mar 1.

**Project:** You will be responsible for producing a presentation and a 10-15 page report on a topic in generalized linear models. The report will be due by in exam week. Further details, including a list of possible topics, will be given as the semester progresses.

# Late assignments

Late submissions will not be accepted. Please refer to Carmen for due dates.

# Instructor 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 **614-688-4357(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**.

- **If you have any questions about your graded assignments, midterm or project, please send me an email – do not use Carmen.**

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

# OTHER COURSE POLICIES

## 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. A more conversational tone 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.

## Academic integrity policy

See **Descriptions of major course assignments**, above, for my specific guidelines about collaboration and academic integrity in the context of this online class.

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/**.

**If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct.** If COAM determines that you have violated the university's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- Committee on Academic Misconduct web page (go.osu.edu/coam)
- Ten Suggestions for Preserving Academic Integrity (go.osu.edu/ten-suggestions)

# Copyright for instructional materials

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

# Commitment to a diverse and inclusive learning environment

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

# Land Acknowledgement

We would like to acknowledge the land that The Ohio State University occupies is the ancestral and contemporary territory of the Shawnee, Potawatomi, Delaware, Miami, Peoria, Seneca, Wyandotte, Ojibwe and Cherokee peoples. Specifically, the university resides on land ceded in the 1795 Treaty of Greeneville and the forced removal of tribes through the Indian Removal Act of 1830. I/We want to honor the resiliency of these tribal nations and recognize the historical contexts that has and continues to affect the Indigenous peoples of this land.

More information on OSU's land acknowledgement can be found here:
https://mcc.osu.edu/about-us/land-acknowledgement

# Your mental health

As a student you may experience a range of issues that can cause barriers to learn, 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. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, on-demand resources are available at go.osu.edu/ccsondemand. 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 Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org. The Ohio State Wellness app is also a great resource available at go.osu.edu/wellnessapp.

# ACCESSIBILITY ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

## Requesting accommodations

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; 098 Baker Hall, 113 W. 12th Avenue.

## Accessibility of course technology

This online course requires use of CarmenCanvas (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.

- Canvas accessibility (go.osu.edu/canvas-accessibility)
- Streaming audio and video
- CarmenZoom accessibility (go.osu.edu/zoom-accessibility)
- Collaborative course tools

# COURSE SCHEDULE

Refer to the Carmen course for up-to-date assignment due dates.

| Week | Dates | Topics |
|---|---|---|
| 1 | Jan 11, 13 | Introduction to generalized linear models (GLMs): form and function |
| 2 | Jan 18, 20 | Parameter estimation for GLMs<br><br>Goodness of fit for GLMs<br><br>Binary GLMs for binary data: The binomial distribution and a review of inference for a binomial proportion |
| 3 | Jan 25, 27 | Binary GLMs for binary data: The binomial distribution and a review of inference for a binomial proportion; Simple linear logistic regression; Choice of links, and residual analysis |
| 4 | Feb 1, 3 | Binary GLMs for binary data: Choice of links, and residual analysis; Models with factor covariates; Model building |
| 5 | Feb 8, 10 | Binary GLMs for binary data: Model building<br><br>Poisson GLMs: Motivation and modeling; Doctors and smoking case study |
| 6 | Feb 15, 17 | Poisson GLMs: Types of zero counts and existence of ML estimates; Loglinear models |
| 7 | Feb 22, 24 | Overdispersion: Definition and mechanisms; Modeling in the presence of overdispersion |
| 8 | Mar 1, 3 | Overdispersion: Modeling in the presence of overdispersion<br><br>Midterm exam (Mar 3) |
| 9 | Mar 8, 10 | Gamma GLMs and influence for GLMs |
|  | Mar 15, 17 | (Spring break) |
| 10 | Mar 22, 24 | Bayesian inference for generalized linear models (GLMs)<br><br>Quasi-Likelihood and Inference |
| 11 | Mar 29, 31 | Quasi-Likelihood and Inference;<br><br>Empirical variance estimates |
| 12 | Apr 5, 7 | Generalized linear models for dependent data |
| 13 | Apr 12, 14 | Inference for marginal GLMs; Marginal models – the seizures case study; Random effects GLMs |
| 4 | Apr 19, 21 | Project presentations |

# Stat 7430 (Spring 2020): Generalized Linear Models

## Lecturer

Peter F. Craigmile, Ph.D.
`pfc@stat.osu.edu`
Office hours in 427 Cockins Hall: Mon 3-4pm, Thu 1.30-2.30pm, or by appointment.

## Grader

Hengrui Luo
`luo.619@osu.edu`

## Lectures

Tues and Thu, 9.35-10.55pm in Cockins Hall (CH) 228
Holidays: Martin Luther King, Jr. Day is January 20; Spring break is March 9–13.
Please download notes from the class website on Carmen
Lectures may not be recorded.

## Class Attendance Policy

You are expected to attend all lectures.

## Course Description

Stat 7430 introduces the statistical theory and methods to extend regression and analysis of variance to non-normal data. By the end of the course students should be able to use fixed effect generalized linear models to model data. In particular there will be a focus on model identification, building, diagnostics, and inference. This course covers extensions to longitudinal models.

**Prequisites**: Stat 6910, 6950 (Applied Statistics I and II) giving exposure to analysis of variance and experimental design, as well as regression modeling – Stat 7410 (Theory of Linear Models) provides the theory for these models. Stat 6801–6802 (Statistical Theory I and II), introducing distribution theory and methods for statistical estimation and testing.

## Textbook

P. McCullagh and J.A. Nelder (1999), Generalized linear models, second edition, Chapman and Hall/CRC Press, London; New York. (This is a reprint of the 1989 Chapman and Hall book).
I will highlight other useful references as the course progresses.

## Computing

This class requires you to use the statistical software packages R and RStudio.
More details will be given in class and on the class web site.

### Evaluation

| Homework | Midterm | Project |
|:---:|:---:|:---:|
| 30% | 30% | 40% |

Grades will be recorded on Carmen

**Homework** will be due at the **beginning** of class on the day it is due. **No** late homework will be accepted. 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 made an attempt of the questions.

The **midterm** will be held in class on Thu 27 Feb. All exams are closed book/closed notes. There will be **no make-up** exams. A basic calculator is allowed – tablets, laptops, cellphones, and other communication devices are not. You will be permitted to bring along one standard sized sheet of written notes to the midterm exam. **There will be no make-up exams.**

**Project**: You will will be reponsible for producing a presentation and a 10-15 page report on a topic in generalized linear models. The presentation will be given towards the end of the semester. The report will be due by noon on Thu 23 April (exam week). Further details, including a list of possible topics, will be given as the semester progresses.

### 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://studentaffairs.osu.edu/csc/).

### Disability Statement

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; http://www.ods.osu.edu/.

### 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 I reserve the right to change due dates or the methods of assessment. Official announcements will ALWAYS be those made in class.**

# Distance Approval Cover Sheet
## For Permanent DL/DH Approval | College of Arts and Sciences

Course Number and Title: STAT 7430: GENERALIZED LINEAR MODELS

## Carmen Use

*Please consider using [ASC's distance learning course template](https://teaching.resources.osu.edu/teaching-topics/carmen-common-sense-best-practices). For more on use of Carmen: https://teaching.resources.osu.edu/teaching-topics/carmen-common-sense-best-practices*

A Carmen site will be created for the course, including a syllabus and gradebook at minimum. YES

If no:

## Syllabus

Proposed syllabus uses the ASC distance learning syllabus template, includes boilerplate language where required, as well as a clear description of the technical and academic support services offered, and how learners can obtain them. YES

Syllabus is consistent and is easy to understand from the student perspective. YES

Syllabus includes a schedule with dates and/or a description of what constitutes the beginning an end of a week or module. YES

If there are required synchronous sessions, the syllabus clearly states when they will happen and how to access them. YES

Additional comments (optional):

## Instructor Presence

*For more on instructor presence: [https://teaching.resources.osu.edu/teaching-topics/online-instructor-presence](https://teaching.resources.osu.edu/teaching-topics/online-instructor-presence)*

Students should have opportunities for regular and substantive academic interactions with the course instructor. Some ways to achieve this objective:

**X** Regular instructor communications with the class via announcements or weekly check-ins

**X** Instructional content, such as video, audio, or interactive lessons, that is visibly created or mediated by the instructor

**X** Regular participation in class discussion, such as in Carmen discussions or synchronous sessions

**X** Regular opportunities for students to receive personal instructor feedback on assignments

Please comment on this dimension of the proposed course (or select/explain methods above):
Course is taught live, two times a week. Material involves the presentation of material, working through examples collaboratively, and interactive data analyses and discussion.

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## Delivery Well-Suited to DL/DH Environment

*Technology questions adapted from the Quality Matters rubric. For information about Ohio State learning technologies: https://teaching.resources.osu.edu/toolsets*

The tools used in the course support the learning outcomes and competencies. YES

Course tools promote learner engagement and active learning. YES

Technologies required in the course are current and readily obtainable. YES

Links are provided to privacy policies for all external tools required in the course. YES

Additional technology comments:
Course requires the statistical software package R.

Which components of this course are planned for synchronous delivery and which for asynchronous delivery? (For DH, address what is planned for in-person meetings as well.)
Lectures are presented synchronously.

If you believe further explanation would be helpful, please comment on how course activities have been adjusted for distance learning:

## Workload Estimation

*For more information about calculating online instruction time: ODEE Credit Hour Estimation*

Course credit hours align with estimated average weekly time to complete the course successfully. YES

Course includes direct (equivalent of "in-class") and indirect (equivalent of "out-of-class") instruction at a ratio of about 1:2. YES

Provide a brief outline of a typical course week, categorizing course activities and estimating the approximate time to complete them or participate:
Homework is due every 1.5-2 weeks.  Assignments are a mix of theoretical and applied statistics problems.

In the case of course delivery change requests, the course demonstrates comparable rigor in meeting course learning outcomes. YES

## Accessibility

*For more information or a further conversation, contact the accessibility coordinator for the College of Arts and Sciences. For tools and training on accessibility: Digital Accessibility Services*

Instructor(s) teaching the course will have taken Digital Accessibility training (starting in 2022) and will ensure all course materials and activities meet requirements for diverse learners, including alternate means of accessing course materials when appropriate. YES (Took training from ODEE previously)

Information is provided about the accessibility of all technologies required in the course. All third-party tools (tools without campus-wide license agreements) have their accessibility statements included. YES

Description of any anticipated accommodation requests and how they have been/will be addressed.

Additional comments:

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# Academic Integrity

*For more information: https://go.osu.edu/teaching-resources-academic-integrity*

The course syllabus includes online-specific policies about academic integrity, including specific parameters for each major assignment: YES

Assignments are designed to deter cheating and plagiarism and/or course technologies such as online proctoring or plagiarism check or other strategies are in place to deter cheating: YES

Additional comments:

# Frequent, Varied Assignments/Assessments

*For more information: https://teaching.resources.osu.edu/teaching-topics/designing-assessments-student*

Student success in online courses is maximized when there are frequent, varied learning activities. Possible approaches:

**X** Opportunities for students to receive course information through a variety of different sources, including indirect sources, such as textbooks and lectures, and direct sources, such as scholarly resources and field observation

**X** Variety of assignment formats to provide students with multiple means of demonstrating learning

**X** Opportunities for students to apply course knowledge and skills to authentic, real-world tasks in assignments

Comment briefly on the frequency and variety of assignment types and assessment approaches used in this course (or select methods above):
Quizzes and assignments vary scope (covering applied and theoretical concepts)

# Community Building

*For more information: https://teaching.resources.osu.edu/teaching-topics/student-interaction-online*

Students engage more fully in courses when they have an opportunity to interact with their peers and feel they are part of a community of learners. Possible approaches:

X Opportunities for students to interact academically with classmates through regular class discussion or group assignments

X Opportunities for students to interact socially with classmates, such as through video conference sessions or a course Q&A forum

X Attention is paid to other ways to minimize transactional distance (psychological and communicative gaps between students and their peers, instructor, course content, and institution)

Please comment on this dimension of the proposed course (or select methods above):
Live lectures allow for working through examples collaboratively, and interactive data analyses and discussion. Students work on group project in the latter part of the course.

# Transparency and Metacognitive Explanations

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*For more information: https://teaching.resources.osu.edu/teaching-topics/supporting-student-learning-your*

Students have successful, meaningful experiences when they understand how the components of a course connect together, when they have guidance on how to study, and when they are encouraged to take ownership of their learning. Possible approaches:

X Instructor explanations about the learning goals and overall design or organization of the course

X Context or rationale to explain the purpose and relevance of major tasks and assignments

X Guidance or resources for ancillary skills necessary to complete assignments, such as conducting library research or using technology tools

X Opportunities for students to take ownership or leadership in their learning, such as by choosing topics of interest for an assignment or leading a group discussion or meeting

X Opportunities for students to reflect on their learning process, including their goals, study strategies, and progress

X Opportunities for students to provide feedback on the course

Please comment on this dimension of the proposed course (or select methods above):
Syllabus, assignments and solutions to exams provide details about relevance. Students need to learn from assignments and textbook reading, in parallel to live lectures. Feedback obtained from students in week 5 of the course.

## Additional Considerations

Comment on any other aspects of the online delivery not addressed above:

The course syllabus is clear and contains all required syllabus elements. Additionally, the course design promotes student interaction to facilitate a community of learners.

**Syllabus and cover sheet reviewed by Jeremie Smith on 8/10/2021**

Additional resources and examples can be found on ASC's Office of Distance Education website.

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