Term Information

Effective Term	Autumn 2023
Previous Value	*Summer 2012*

Course Change Information

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

Refocus course content to have increased applied statistical modeling coverage.

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

Improve distribution of PhD program topics spanning theory and applications.

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)?

This is part of the revision for the PhD in Statistics and the MS in Statistics

Is approval of the requrest contingent upon the approval of other course or curricular program request? Yes

Please identify the pending request and explain its relationship to the proposed changes(s) for this course (e.g. cross listed courses, new or revised program)

This course change is part of a revision in the Ph.D. and M.S. programs in Statistics. This will also affect the content of courses taught in the interdisciplinary

Ph.D. program in Biostatistics.

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	7410
Course Title	Linear Models
Previous Value	*Theory of the Linear Model*
Transcript Abbreviation	Linear models
Previous Value	*Thry Linear Model*
Course Description	Theory of the general linear model, definition, assumptions, estimability,hypothesis testing and multiple comparisions. Modern extensions of the linear model, interpretation, inference, prediciton and penalized estimation. Multivariate linear models.
Previous Value	*Theory of the general linear model, estimability, power and sample size. Random effects and nested models. Analysis of covariance. Models with block variables. Generalized linear models.*
Semester Credit Hours/Units	Fixed: 3

Offering Information

Length Of Course	14 Week, 12 Week, 8 Week, 7 Week, 6 Week, 4 Week
Previous Value	*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?	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	STAT 6802, 6910, 6950, 5861, and 5862; or permission of instructor.
Previous Value	*Prereq: 6802 (622), 6860, and 6950 (645) or 6910 (641); or permission of instructor.*
Exclusions	
Previous Value	Not open to students with credit for 742.
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	• Understanding algebraic and geometric interpretation of the linear model
	• Understanding theory of the linear model
	• Definition and assumptions of the general linear model
	• Inference under the general linear model
	• Carry out appropriate statistical inference under the general linear model.
	• Describe models that extend the linear model
	• Inference and prediction for a variety of models that extend the linear model
	• Interpret results of statistical analyses based on models that extend the linear model
Previous Value	

Content Topic List

- The general linear model (full rank and non-full rank)
- Least squares estimation and estimability
- Generalized least squares
- Gauss-Markov theorem
- Quadratic forms, F-test
- Nonparametric regression: wavelets, splines, trees
- Penalized estimation: ridge regression, LASSO
- Multivariate linear models
- Principle components, factor analysis

Previous Value

- *The general linear model (full rank and non-full rank)*
- *Least squares estimation and estimability*
- *Generalized least squares*
- *Gauss-Markov theorem*
- *Likelihood ratio test*
- *Expected mean squares, power and sample size*
- *Simultaneous confidence intervals*
- *Effect of incorrect error assumptions*
- *Random effects models and mixed models*
- *Nested models and split-plots*
- *Generalized linear models*
- *Analysis of covariance*
- *Linear models for block designs*

Sought Concurrence   No

Attachments

- STAT7410_syllabus.pdf: Syllabus

  (Syllabus. Owner: Craigmile,Peter F)

- au22-stat-7410-herbei.pdf: Old syllabus

  (Syllabus. Owner: Craigmile,Peter F)

Comments

- Same for this one *(by Vankeerbergen,Bernadette Chantal on 12/03/2022 09:16 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Craigmile,Peter F	12/02/2022 08:33 AM	Submitted for Approval
Approved	Craigmile,Peter F	12/02/2022 05:27 PM	Unit Approval
Revision Requested	Vankeerbergen,Bernadette Chantal	12/03/2022 09:16 PM	College Approval
Submitted	Craigmile,Peter F	12/03/2022 09:31 PM	Submitted for Approval
Approved	Craigmile,Peter F	12/03/2022 09:31 PM	Unit Approval
Approved	Vankeerbergen,Bernadette Chantal	12/04/2022 06:02 PM	College Approval
Pending Approval	Cody,Emily Kathryn Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Hilty,Michael Vankeerbergen,Bernadette Chantal Steele,Rachel Lea	12/04/2022 06:02 PM	ASCCAO Approval

SYLLABUS: STAT 7410

Linear Models
Autumn 2023 (full semester)
3 credit hours

COURSE OVERVIEW

Instructor

<NAME TO BE ANNOUNCED>

Email address: <TO BE ANNOUNCED>

Lectures: Monday, Wednesday and Friday, with 55 minute lectures. <TIMES TBA>
<LOCATION TO BE ANNOUNCED>

Office hours: <TO BE ANNOUNCED>

Graduate teaching assistant

<NAME>

Email address: <TO BE ANNOUNCED>

Office hours: <TO BE ANNOUNCED>

Prerequisites

STAT 6802, 6910, 6950, 5861, and 5862; or permission of instructor.

Course description

This is a course on linear models, the most commonly used statistical model. The course will present topics on the definition, estimation and hypothesis testing in this class of models. In addition, we will discuss statistical methods for multiple comparisons. Modern regression models that extend the linear model will be introduced and the concepts of penalized estimation will be explored.

Course learning outcomes

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

- Demonstrate an understanding of the algebraic and geometric underpinnings and interpretation of the linear model;
- Demonstrate an understanding of the theory of the linear model;
- Discuss the definition and the assumptions of the general linear model;
- Carry out appropriate statistical inference under the general linear model;
- Describe the breadth of models that extend the linear model;
- Perform statistical inference and prediction for a variety of models that extend the linear model;
- Interpret the results of statistical analyses based on models that extend the linear model.

COURSE MATERIALS AND TECHNOLOGIES

Textbooks

Required

- *A First Course in Linear Model Theory* by N. Ravishanker and D.K Dey, 2001, CRC Press (This textbook is available on loan from OSU Library);

- *Advanced Linear Modeling: Statistical Learning and Dependent Data* by R. Christensen, 2019, Springer (This textbook is available for download for free from http://proxy.lib.ohio-state.edu/login?url=https://link.springer.com/book/10.1007/978-3-030-29164-8).

Recommended/optional

- I will highlight other useful resources as the course progresses.

Necessary Software and Equipment

- This class requires you to use the statistical software packages called R (The R Project for Statistical Computing; http://www.r-project.org/) and RStudio (https://posit.co). These software packages are available as Free Software with versions compatible with current macOS and Windows operating systems. More details will be given in lectures.

- Access to a computer capable of running the required software, which includes Mac and PC devices running the current macOS or Windows operating system.

GRADING AND FACULTY RESPONSE

ASSIGNMENT CATEGORY	PERCENTAGE
Homework	25
Midterm Exam	35
Final Exam	40
Total	100

Homework: There will be homework assignments posted on the course website. Homework is due approximately once per week, typically on Friday of the week following the homework posting. Check Carmen for exact dates and times. Homework assignments will be submitted for grading via Carmen.

Midterm Exam: There will be one midterm exam. The midterm will be delivered in person, during class time. Information about the exam will be posted well in advance through the course website. If mandated, exams will be delivered online, through Carmen.

Final Exam: There will be one final exam held during exam week in the Department of Statistics computer lab. The final exam will include analysis of provided data using R software. More information will be posted well in advance through the course website.

Midterm – Wednesday, 10/11/23.
Final Exam – To be announced.

Late assignments

<Policy will be added when the course is offered>

Instructor feedback and response time

<Policy will be added when the course is offered>

COURSE SCHEDULE

Refer to the Carmen course for up-to-date assignment due dates. RD indicates the Ravishanker and Dey textbook; C indicates the Christensen textbook.

Week	Dates	Topics	Reading	Homework
1	8/21/23 – 8/27/23	Introduction, Linear algebra	RD Chapter 1	
2	8/28/23 – 9/3/23	Linear models; Least squares; Geometry	RD 2.6, 4.1, 4.2	
3	9/4/23 – 9/10/23	Generalized inverses; Fitted values	RD 3.1, 3.2	Homework 1 due
4	9/11/23 – 9/17/23	Estimability; Gauss-Markov theorem; Generalized LS	RD 4.3, 4.4, 4.5	Homework 2 due
5	9/18/23 – 9/24/23	Multivariate normal pdf; Distr. Of quadratic forms	RD 5.1, 5.2, 5.3	Homework 3 due
6	9/25/23 – 10/1/23	Distr. Of quadratic forms; Inference for estimable functions	RD 5.4, 7.1	Homework 4 due
7	10/2/23 – 10/8/23	F-test	RD 7.1	Homework 5 due
8	10/9/23 – 10/15/23	F-test Midterm (10/11)		
9	10/16/23 – 10/22/23	Nonparametric Regression (wavelets, splines, trees)	C 1.1-1.5	
10	10/23/23 – 10/29/23	Nonparametric Regression (wavelets, splines, trees)	C 1.6-1.12	
11	10/30/23 – 11/5/23	Penalized Estimation (ridge, Lasso)	C 2.1-2.2	Homework 6 due
12	11/6/23 – 11/12/23	Penalized Estimation (ridge, Lasso)	C 2.3-2.6	

Week	Dates	Topics	Reading	Homework
13	11/13/23 – 11/19/23	Multivariate linear models	C 9.1-9.5	Homework 7 due
14	11/20/23 – 11/26/23	Multivariate linear models	C 9.6-9.9	
15	11/27/23 – 12/3/23	Principal Components, factor analysis	C Chapter 14	Homework 8 due

OTHER COURSE POLICIES

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/**.

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 at 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. 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 24/7 by dialing 988 to reach the Suicide and Crisis Lifeline.

ACCESSIBILITY ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Requesting accommodations

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. 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 CarmenCanvas (Ohio State's learning management system) and other 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

SYLLABUS: STAT 7410
THEORY OF THE LINEAR MODEL
AUTUMN 2022

Course overview

Instructor

Instructor: Radu Herbei
Email address: herbei.1@osu.edu
Office hours: Virtual Hours via Carmen Zoom: Tuesdays 9:00-10:00am and by appointment.
Office Location: CH 223.

Course description

This is a course on the theory of the linear model, the most commonly used statistical model. The course will present topics on the definition, estimation and hypothesis testing in this class of models. In addition, we will discuss statistical methods for multiple comparisons and issues related to a breakdown in the model assumptions. More advanced topics in this course include the discussion of blocking, random and mixed effects, and an introduction to generalized linear models.

Course learning outcomes

By the end of this course, students should successfully be able to:
- Understand and discuss the definition and the assumptions of a multivariate linear model
- Carry out appropriate statistical inference (parameter estimation and hypothesis testing) for the parameters involved in a linear model.
- Understand, describe and perform statistical inference for the general linear model.

Course materials

Required

A First Course in Linear Model Theory by N. Ravishanker and D.K Dey, 2001, CRC Press;

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
- Collaborating in CarmenWiki
- 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

- 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 class meets on MWF from 1:50pm – 2:45pm in BO0311. The class is offered "in-person". Unless mandated by the University, the class will not have a parallel online content-delivery system.

The instructor will hold weekly office hours via CarmenZoom as indicated above. The instructor may initiate and manage active discussion boards, also via Carmen.

Grading and faculty response

Grades

Assignment or category	Percentage
Homework	25%
Exam 1	25%
Exam 2	25%
Exam 3	25%
Total	100%

Assignment information

Homework: There will be weekly homework assignments posted on the course website. Homework is due once per week, with dates and times provided as needed. Homework assignments will be submitted for grading via Carmen.

Exams: There will be three exams. All exams will be delivered in person, during class time. Information about the exams will be posted well in advance through the course website. If mandated, exams will be delivered online, through Carmen. For online exams, **Proctorio** may be used as a security tool.

Exam I – Wednesday, 09/28/22.
Exam II – Wednesday, 11/02/21.
Exam III – Wednesday, 12/07/22.

Late assignments

Generally, late assignments are not accepted, and **written documentation is required** for missed assignments. 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.

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 **7 days**.

E-mail

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

Discussion board

I will check and reply to messages in the discussion boards every **24 hours on school days**.

Attendance, participation, and discussions

Student participation requirements

The following is a summary of everyone's expected participation:

- Since the class is offered in-person, students are required to attend class **in person**. However, attendance will not play a factor in your final grade.

- **Logging in to Carmen**: **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 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.*

- **Office hours**: **OPTIONAL OR FLEXIBLE**
  My office hours, are optional. If you 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.

- **Participating in discussion forums**: **OPTIONAL, SEVERAL TIMES PER WEEK**
  You are encouraged to participate in discussion forums, if you choose to do so.

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 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.

I expect that you will read and follow the guidelines and requirements for campus safety, which are available at 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 online course

- **Quizzes and 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. You are encouraged to ask a trusted person to proofread your assignments before you turn them in--but no one else should revise or rewrite your 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 opportunities for 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. You must obtain my permission before sharing any of the materials associated with this course with others not enrolled in the class.

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, Kellie Brennan, at titleix@osu.edu

Accessibility accommodations for students with disabilities

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. 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; http://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, I 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.

Week	Dates	Topics, Readings, Assignments, Deadlines
1	8/22/22 – 8/28/22	Introduction, Linear algebra
2	8/29/22 – 9/4/22	Linear models; Least squares; Geometry
3	9/5/22 – 9/11/22	Generalized inverses; Fitted values
4	9/13/22 – 9/18/22	Estimability; Gauss-Markov theorem
5	9/19/22 – 9/25/22	Multivariate normal pdf; Distr. Of quadratic forms
6	9/26/22 – 10/2/22	Inference for estimable functions; Midterm
7	10/3/22 – 10/9/22	F-test
8	10/10/22 – 10/16/22	Likelihood ratio test
9	10/17/22 – 10/23/22	Confidence intervals
10	10/24/22 – 10/30/22	Departures from the assumptions
11	10/31/22 – 11/6/22	Consistency; Midterm
12	11/7/22 – 11/13/22	Diagnostics; Residuals; Outliers
13	11/14/20 – 11/20/20	Prediction
14	11/21/20 – 11/27/20	Generalized Linear Models
15	11/28/20 – 12/4/20	Special Topics (maybe)
16	12/05/22 – 12/07/22	Review