



THE OHIO STATE UNIVERSITY

STAT 6450

Applied Regression Analysis (20961)

Autumn 2026

Syllabus - Graduate Instructor Information

Name: Isa Marques

Professional Qualifications

Ph.D., Applied Statistics, University of Göttingen

Master's, Economics with specialization in Statistics, University of Bonn

Bachelor's, Economics, Nova School of Business and Economics

Syllabus - Required or Recommended Readings

Weisberg, S. Applied Linear Regression, 4th ed.; Wiley: Hoboken, New Jersey, 2014.

Syllabus - Course Schedule

Week	Topics
1	Assessment test; principles of data collection
2	Simple Linear Regression (SLR) – estimation and inference
3	SLR – inference and ANOVA; visual diagnostics
4	SLR – diagnostic tests and remedies
5	SLR – joint inference of parameters
6	Logistic regression – estimation, inference and deviance
7	Logistic regression – model comparison
8	Logistic regression – residuals and diagnostics
9	MLR – estimation and inference; linear algebra recap
10	MLR – weighted least squares and diagnostics
11	MLR – categorical variables; model selection
12	Cross-validation and bias-variance tradeoff
13	Logistic regression – model selection and predictive performance
14	Project presentations
15	Regularized regression (ridge and LASSO)
16	Wrap-up

Course Details - Instructor Contact Details

Email address: marques.130@osu.edu

Course Details - Office Hours

Date & Time: Thursdays 11:00-12:00 or by appointment

Office: Cockins Hall 205B

Course Details - Additional Instructional Staff

Jiwon Hong (hong.1069@osu.edu)

Course Details - Class Meeting Details

Class Meeting Details: 09:05 AM-10:55 AM - 209 W 18th Ave 275 - TR

Course Details - Course Description

Simple and multiple linear regression, diagnostics, model selection, models with categorical variables. Prereq: 6201, or equiv, or permission of instructor. Not open to students with credit for 6950.

Course Details - More About This Course

Optional References (not required):

Applied Linear Regression Models, 5th edition, by Kutner, Nachtsheim, Neter, and Liwith, McGraw-Hill, 2024

Course Details - 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
- Understand the bias-variance trade-off

- 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
- Extend the above knowledge to logistic regression

Course Details - Course Supplies

Software & Laptop use:

This class requires you to use the statistical software package R (The R Project for Statistical Computing; <http://www.r-project.org/>). This software package is available as Free Software.

Please **bring your laptop to every class meeting**, as this course includes a lab component. If this is impractical or impossible for you, contact me as early in the semester as possible so we can work out an alternative.

Course Details - Detailed Course Schedule

Week	Dates	Topics
1	Aug 25, 27	Assessment test; principles of data collection
2	Sep 1, 3	Simple Linear Regression (SLR) – estimation and inference
3	Sep 8, 10	SLR – inference and ANOVA; visual diagnostics; Homework1
4	Sep 15, 17	SLR – diagnostic tests and remedies; Quiz 1
5	Sep 22, 24	SLR – joint inference of parameters

Week	Dates	Topics
6	Sep 29, Oct 1	Logistic regression – estimation, inference and deviance
7	Oct 6, 8	Logistic regression – model comparison; Homework 2
8	Oct 13, 15	Quiz 2; Logistic regression – residuals and diagnostics
9	Oct 20, 22	MLR – estimation and inference; linear algebra recap
10	Oct 27, 29	MLR – weighted least squares and diagnostics
11	Nov 3, 5	MLR – categorical variables; model selection; Homework 3
12	Nov 10, 12	Quiz 3; Cross-validation and bias-variance tradeoff
13	Nov 17, 19	Logistic regression – model selection and predictive performance
14	Nov 24; no class Nov 26, Thanksgiving	Project presentations
15	Dec 1, 3	Regularized regression (ridge and LASSO); Homework 4
16	Dec 8	Quiz 4; Wrap-up

Course Details - Canvas Assignment Schedule

Date	Name	Assignment Type	Points
9/14/26	Homework 1	Homework	100
9/17/26	Quiz 1	Quiz	100
10/11/26	Homework 2	Homework	100
10/13/26	Quiz 2	Quiz	100
11/6/26	Homework 3	Homework	100
11/10/26	Quiz 3	Quiz	100
11/24/26	Project Presentation	Presentation	100
12/6/26	Homework 4	Homework	100
12/8/26	Quiz 4	Quiz	100
12/13/26	Project Report	Report	100
12/2/26	Peer Presentation Comments	Report	100

Course Details - Grading Policy

Assignment Weights & Details

Assignment	Percentage
Homework	5%
Quizzes	55%
Project Report	20%

Assignment	Percentage
Project Presentation	10%
Peer Presentation Comments	10%

Homework - 5%

Homework is graded on a completion / good-faith attempt basis only. Submissions are not graded for correctness and will not receive individualized feedback. The solutions are provided.

Quizzes - 55%

Quizzes are closed book and closed notes. You may bring one formula sheet on a single standard sheet of paper (8.5" × 11"), using both sides. The sheet must be in your own handwriting - written by hand on paper, or handwritten on a tablet and printed. Typed sheets are not permitted. The sheet may contain formulas, definitions, and notation, but may not reproduce solutions to homework or practice problems. You may use a calculator.

Formula sheets are collected with the quiz and returned to you afterward.

Project Report - 20%

You will complete a data analysis project culminating in a written report and an in-class presentation. Depending on enrollment, projects may be completed individually or in small groups; I will confirm the arrangement in the first weeks of the semester.

The report is due at the end of the semester. This is a semester-long project, not a final-weeks assignment - you are expected to work on it throughout the term, and the scope of the report reflects that expectation.

Project Presentation - 10%

Each individual or group will present their work once during the final weeks of class. You will also be assigned one classmate's/group's presentation to comment on.

Peer Presentation Comments - 10%

You will be randomly assigned one classmate's presentation to comment on via pdf submitted on Carmen. Aim for 200-300 words.

A useful comment engages with the content of the presentation: a question about a modeling choice, a suggestion for an alternative approach, a connection to material from another week, or a specific point where you would push back on the reasoning. Comments that only address delivery ("great job," "nice slides") will not receive credit.

I review all comments before releasing them to the corresponding classmate. If a comment is not constructive, I will return it to you with feedback (by email). Revise and re-submit within 48 hours (working days) to receive full credit; comments not revised by that deadline are subject to late submission penalties.

Additional Policies:

Late Submission Policy:

The penalty for late submissions is 10% of the grade per hour. After 10 hours, the score is 0.

If you anticipate needing an exception, you must contact the instructor before the deadline. Exceptions may be granted only in cases of significant circumstances.

Regrade Requests

If you have concerns about a grade you have 14 days to contact the instructor.

Curving Grades:

Please do not contact the instructor about curving grades until all course assessments are completed. Curves, if any, will be applied only after the full set of grades is available.

Course Details - Grading Scale

Letter Grade	Percentage Range
A	100% to 93%
A-	< 93% to 90%
B+	< 90% to 87%
B	< 87% to 83%
B-	< 83% to 80%
C+	< 80% to 77%
C	< 77% to 73%
C-	< 73% to 70%
D+	< 70% to 67%
D	< 67% to 60%
E	< 60% to 0%

Course Details - Instructor Policies

Grading and feedback

For assignments, you can generally expect feedback within 10 days.

E-mail

I will reply to e-mails within 48 hours on school days. Specific technical questions about the course material that require significant back-and-forth communication are not well suited for e-mail; while I will do my best to answer such questions, I may ask that you attend office hours if your question isn't easily answerable over email.

Preferred contact method:

- If you have questions about the lectures or notice any typos in the materials, please email the instructor.

- Use email address rather than messages via Carmen.

Course Details - Course Policies

Use of recording devices in class

In accordance with Ohio Administrative Code Rule 3357-15-13-37, electronic recording (for example, photo, audio, or video) of class lectures or activities is prohibited. Exceptions may only be granted when a student has a documented accommodation approved by Student Life Disability Services and has informed the instructor of the accommodation, or has obtained prior written permission from the instructor.

Course Details - AI Use Policy

GenAI can fabricate information (for example, creating citations to sources that do not exist) or omit key information. You are ultimately responsible for the accuracy and integrity of your submitted work. Unless explicitly permitted below, representing AI-generated content as your own work is a violation of the Code of Student Conduct. Please check with your instructor if you have questions.

These levels may apply to the entire course or specific assignments, as indicated by the instructor:

- **Permitted:** You must personally author the entire initial draft without AI assistance. Then you may use GenAI to critique your logic, improve grammar, clarity, etc.
- **Prohibited:** The materials in this course may be subject to copyright protection. Do not input or allow AI to access external or instructor-created course materials (e.g., assigned readings, slides) without explicit instructor permission. When seeking feedback, students may not use AI to generate new content, rewrite whole sections, fill in missing analysis or evidence, or create thesis statements or conclusions.

- **Requirement:** The core ideas and original text/work must remain yours. You are responsible for the accuracy and appropriateness of any AI-suggested revisions and ensuring that AI does not obscure your individual learning or voice. You should document and critically evaluate AI suggestions before accepting them.

Syllabus - University Policies

Office of Undergraduate Education - Standard Syllabus Statements

- [Academic Misconduct](#)
- [Religious Accommodations](#)
- [Accommodations for Disability and Illness](#)
- [Intellectual Diversity](#)
- [Grievances and Solving Problems](#)
- [Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct](#)
- [Copyrights](#)
- [Content Warnings](#)
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- [Resources for Military-Connected Students](#)
- [Campus-wide Class Cancellations](#)