

**SYLLABUS: STATISTICAL MODELING**

**(BANA 7042)**

**CARL H. LINDNER COLLEGE OF BUSINESS**

**SPRING 2025 (Jan 13-Mar 2)**

**Course Information**

Credit Hours: 2

Level: Graduate

Instructor: Dr. Brandon Greenwell (adjunct from 84.51°)

Contact email: [greenwbm@ucmail.uc.edu](mailto:greenwbm@ucmail.uc.edu)

Office: NA

**Meeting Information**

Time:

* Section 001: Tue 6:00-9:50 (PM)
* Section 002: Wed 6:00-9:50 (PM)

Communication: In-class lectures and Microsoft Teams

Structure: we will adopt a **hybrid mode** to meet and learn in this course.

* Lecture videos have been prerecorded and posted in Canvas. Students are expected to watch the videos before our meetings.
* We will use the meeting each week to

1. review key points;
2. answer questions;
3. run through example R code together.

The meetings will also be recorded via Echo360.

Office hours: by appointment (typically before class).

**Course Materials**

Provided: class notes will be posted on Canvas.

Optional (but recommended):

Julian J. Faraway. *Extending the Linear Model with R – Generalized Linear, Mixed Effects and Nonparametric Regression Models,* Second Edition, CRC Press

Michael Friendly and David Meyer. *Discrete Data Analysis with R – Visualization and Modeling Techniques for Categorical and Count Data*, CRC Press

**Course Description**

This course extends the modeling ideas and concepts used in linear regression to generalized linear regression models. We will show how to establish statistical models for binary data, binomial data, ordinal data, multinomial data, and count data. The emphasis will be placed on data interpretation, modeling ideas, numerical implementation, and result communication. A variety of real data sets will be provided and the computing program R will be used to gain hands-on experience.

# Link to Pace:



This course aligns with PACE, the Lindner College of Business platform for developing the *total* business professional.

## P – Professionalism

* Enhance oral & written ***communication***, express ideas clearly, logically and persuasively.
* Develop and practice ***teamwork*** skills through group projects and exercises.
* Practice professional habits of punctuality, preparation, respect and participation.

## A – Academics

* Develop foundational knowledge of core ***business functions*** and their interactions within firms.
* Begin applying functional and cross-functional knowledge ***to critically analyze business problems***; for example applying techniques for business plan development.

## C – Character

* Learn and apply ***leadership*** techniques for project management (plan, brief, execute, debrief).
* Build an understanding and initial skills of ***managing diversity***, including understanding cultural differences, and challenges and opportunities of global business.
* Understand importance of ***ethics and social responsibility*** in business and personal settings.

## E – Engagement

* Build understanding of importance and practices of ***networking*** through interactions with business professionals and guest speakers.

Develop awareness and appreciation of ***involvement*** in social organizations, community service, and pr

**Course Policies**

1. ***Academic Integrity:*** As with all Lindner College of Business efforts, this course will uphold the highest ethical standards, critical to building character. Ensuing your integrity is vital and your responsibility. LCB instructors are required to report ANY incident of academic misconduct (e.g., cheating, plagiarism) to the college review process, which could result in severe consequences, including potential dismissal from the college. For further information on Academic Misconduct or related university policies and procedures, please see the UC Code of Conduct (<http://www.uc.edu/conduct/Code_of_Conduct.html>).

“**TWO STRIKES POLICY”**

All academic programs at the Lindner College of Business apply a “Two Strikes Policy” regarding Academic Integrity. **Any student who has been found responsible for two cases of academic misconduct may be dismissed from the College.** The “Two Strikes Policy” supplements the UC Student Code of Conduct.

**All cases of academic misconduct (e.g., cheating, plagiarism, falsification) will be formally reported by faculty.** Students will be afforded due process for allegations, as outlined in the policy. If a student is found guilty of academic misconduct in two instances, the student may be dismissed from the Lindner College of Business.

The “Two Strikes Policy” is now **in effect**.

2. ***Attendance***: Attendance and participation in each meeting is critical to understanding the material. I will be covering material not in the book and class notes are important for these topics. Please join the meeting on time and be prepared to participate in exercises and discussions.

3. ***Etiquette rules***: During our virtual meetings, you can stay relaxed while being able to focus on various learning activities. Feel free to have some drinks/snaps around you. On the other hand, I would encourage you to

* Turn on your camera when you speak so other fellow students can get to know you;
* dress appropriately;
* **clean your computer desktop and web browser** to avoid showing private or sensitive information in case you need to share your screen.

4. ***Disability***: Students with disabilities who need academic accommodations or other specialized services while attending the University of Cincinnati will receive reasonable accommodations to meet their individual needs as well as advocacy assistance on disability-related issues. Students requiring special accommodation must register with the Disability Services Office. <http://www.uc.edu/sas/disability>

5. ***Grade appeals*:** If you think the grade of your work (homework or projects) is miscalculated, you have the right to appeal. The appeal must be done (through email) **within 7 calendar days** since the grade is released/posted. After that, your grade is final and will not be changed.

6. ***Weather Related Policy***: In case classes are cancelled due to the University closure, we will consider making the final exam take-home or/and uploading teaching videos and assigning reading materials. The University weather related policy can be found at

<http://www.uc.edu/provost/faculty/resources/weather-related-policy-and-protocols.html>

**Grading Policies**

Grading is based on an assigned project. The project is to analyze a real data set and write an analytical report. Each student is expected to perform data manipulation, cleaning, summary, visualization, analysis and reporting on **individual** basis.

**Tentative Schedules**

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|  | Topics | Reading Materials |
| Week 1 | A Review of Linear Regression Models   1. The landing data 2. Main idea of linear models 3. Estimation 4. Hypothesis testing 5. Linear models for binary data? | Chapters 1\* |
| Week 2 | Logistic Regression I   1. The heart disease data 2. How to summarize binary data? 3. How to visualize binary data? 4. Main idea of extending a linear model to a binary response 5. Linear versus logistic 6. Prediction 7. Interpretation of the coefficients | Chapter 2\* |
| Week 3 | Logistic Regression II   1. Model inference 2. Variable selections based on significance, AIC, or predictive power 3. Variations of logistic regression: probit link and cloglog link | Chapter 3\* |
| Week 4 | Extending logistic regression models   1. The Challenger data 2. Modeling binomial data 3. Overdispersion | Chapter 4\* |
| Week 5 | Modeling multinomial data   1. US presidential election data 2. Modeling ordinal data 3. Proportional odds model 4. Non-proportional odds model 5. Other link functions 6. Modeling multinomial data without order | Chapter 7\* |
| Week 6 | Modeling count data   1. Poisson distribution 2. Galapagos Islands species data 3. Poisson regression 4. Dispersion | Chapters 5\* |
| Week 7 | Advanced topics and discussion |  |

\* Julian J. Faraway. *Extending the Linear Model with R – Generalized Linear, Mixed Effects and Nonparametric Regression Models,* Second Edition, CRC Press (**NOT REQUIRED**)

**Miscellaneous**

***Counseling Services, Clifton Campus:*** Students have access to counseling and mental health care through the University Health Services (UHS), which can provide both psychotherapy and psychiatric services. In addition, Counseling and Psychological Services (CAPS) can provide professional counseling upon request; students may receive five free counseling sessions through CAPS without insurance. Students are encouraged to seek assistance for anxiety, depression, trauma/assault, adjustment to college life, interpersonal/relational difficulty, sexuality, family conflict, grief and loss, disordered eating and body image, alcohol and substance abuse, anger management, identity development and issues related to diversity, concerns associated with sexual orientation and spirituality concerns, as well as any other issue of concerns. After hours, students may call UHS at 513-556-2564 or CAPS Cares at 513-556-0648. For urgent physician consultation after-hours students may call 513-584-7777.

***Title IX:*** Title IX is a federal civil rights law that prohibits discrimination on the basis of your actual or perceived sex, gender, gender identity, gender expression, or sexual orientation. Title IX also covers sexual violence, dating or domestic violence, and stalking. If you disclose a Title IX issue to me, I am required forward that information to the Title IX Office. They will follow up with you about how the University can take steps to address the impact on you and the community and make you aware of your rights and resources. Their priority is to make sure you are safe and successful here. You are not required to talk with the Title IX Office. If you would like to make a report of sex or gender-based discrimination, harassment or violence, or if you would like to know more about your rights and resources on campus, you can consult the website www.uc.edu/titleix or contact the office at 556-3349.

The end.