Course Syllabus

General Course Information

NPHD9040
Applied Multivariable Analysis
Spring 2026

Class Meeting Time and Location

PROCTER 283N or Microsoft Teams (via calendar invitation)

- 9:30-10:20 Asynchronous Watch Video Lecture
- 10:30-12:20 Discussion and Lab Time (Either in-person or online via Teams)

Credit Hours/Contact Hours

	Credit Hours	Clock Hours
Course	3	45

Instructor Name

Joshua Lambert, PhD, MS, MS

Instructor Email

Joshua.lambert@uc.edu

Instructor Office Hours

By appointment (please email)

Communication Policy

Email is best way to reach me, please give at least 24 hours to respond. Emails sent on Friday's can will be responded to no later than Monday. If you do not hear from me in two business days, please email me again.

Course Description

This course is the first of two which introduce advanced statistical methods used in doctoral level nursing research. Method selection, application, and results interpretation and presentation are stressed in a flipped-classroom/workshop format. Methods introduced include partial correlation, multi-way ANOVA, ANCOVA, multiple regression, logistic regression, and multilevel models. An introduction to power and sample size calculation by method is integrated throughout. - Prerequisite Definition: To take this course you must: Have taken the following Course NPHD9000 min grade B-. Be enrolled in the following Plan NRES-PHD.

Classroom Procedures/Policies

All classroom procedures and policies including required technology, communication policy, netiquette, technology support, accessibility policy, academic integrity, academic honor pledge, religious accommodations, student resources, and student assault resources can be found on the Canvas course home page under the *Classroom Procedures and Policies* link.

Student Learning Outcomes (Competencies)

At the end of this course, the student will:

Student Learning Outcomes	
SLO #1	Select the appropriate multivariate analysis method based on research objectives and types of variables to be analyzed.
SLO #2	Generate required sample size and power for prototypical analyses by multivariable method, concurrently addressing inclusion of under-represented groups in research.
SLO #3	Display an introductory level ability to manage data and conduct preliminary analyses to assess and address data quality and potential violations of statistical assumptions by multivariable method.
SLO #4	Demonstrate an introductory level ability to generate results, using selected statistical analysis software (e.g., SPSS, JMP, SAS or R), and interpret relevant results generated for each method.

Pre- & Co-requisites

Pre-requisites

NPHD9000 and NPH9040 or equivalent.

Co-requisites

None

Course Format

Class Format

All students are required to register for Canvas. You are expected to check the course canvas and website site (https://joshuawlambert.github.io/NPHD9040/) regularly.

In addition, you will need access to Microsoft files on the device that you use for the course. If you do not have access to this software on your home device, you can purchase this software at the UC bookstore or use the computers at Procter Hall. You are expected to check the course canvas and website regularly.

You are required to check your UC email account regularly. The faculty will contact you via your UC email account as needed and will not use a personal (non-UC) email account.

Teaching Strategies

Data analysis and interpretation group workshop, class quizzes, and peer review.

Active learning strategies will be used throughout the semester. Examples of strategies that will be used include: faculty and student-led discussions, short essay papers, creating professional academic documents, and presentations.

The textbook readings and additional resources posted in the modules provide background information so you can explore, learn about, discuss, and debate the use of statistical analysis in research.

Grammar, spelling, and correct statistical formatting are critical components of scholarly written communication and all professional communication. Please include references when referring to the work of others.

Canvas will be used to submit assignments and communication. Email will also be used to communicate. The course website (https://joshuawlambert.github.io/NPHD9040/) will be used to distribute course materials (lecture notes, videos, homework, project, and other assignments/materials).

Teaching: Course Philosophy

In my classroom I view teaching as a partnership between professor and student, grounded in mutual respect, curiosity, and real-world relevance. I strive to connect personally with each learner, recognizing that life circumstances shape how they engage with material, and to present content through verbal, visual, and written modalities so every learning style is addressed. For PhD nursing students, my focus is on experiential learning: applying statistical methods directly to their own research questions, interpreting results in a supportive, non-competitive environment, and using technology to model the data-driven decisions that shape modern nursing practice. By weaving these elements together, I aim to equip students with both confidence and competence in biostatistics so they can advance science and improve patient care.

To Be Successful

- Get familiar with the course website, video lectures and other materials
- Ask questions promptly
- Engage with the material
- Familiarize yourself with statistical software
- Meet deadlines consistently
- Use office hours and resources
- Participate actively online
- Apply concepts to your research

Course Materials

Technology Requirements

- Computer(PC/MAC)
- Access to the internet
- Access: https://joshuawlambert.github.io/NPHD9040/a
- Microsoft Office (Word, Excel, PowerPoint …)
- Either: R, SAS, SPSS, JMP or another statistical software you would like to learn. This class will primarily use R and JMP (Free to students with edu email) for lab learning, but you are welcome to use any other statistical software on assignments.
- University Email Address
- Canvas

Required Resources

1. R (Free)
2. R Studio
3. JMP (Free to students with edu email)

Optional Resources

Lots of possible resources for you. You can find many examples here: https://joshuawlambert.github.io/NPHD9040/

Assessments, Assignments, and Grading Policies

Method for Calculation of Course Grade

Detailed Grading Breakdown

WORKSHOP ATTENDANCE AND PARTICIPATION (13 CLASS WORKSHOPS; 30%)

HW (4 HW TOTAL; 30%)

All HW will be given exactly two weeks prior to its due date. HW is meant to assess your understanding of statistical software, conceptual knowledge of methods discussed, data quality issues, and statistical interpretation. Each HW will have a more detailed outline of how points are distributed. **GRADING:**

Methods	10%
Software	10%
Data quality and statistical interpretation	10%
TOTAL	**30%**

PROJECT PROPOSAL (2 PROPOSALS: 1 MIDTERM, 1 FINAL; 10%)

Students will choose a dataset of their liking (Dr. Lambert will provide up to three datasets, but students can choose their own). The student should set up a meeting with Dr. Lambert to discuss their project and planned course of action. Each project will have a required a proposal. The proposal should be 1-2 pages. This proposal should mimic a statistical analysis plan. **GRADING:**

Meeting with Dr. Lambert	2%
Statistical Analysis Plan	6%
Goals	2%
TOTAL	**10%**

PROJECT PAPERS (2 PAPERS: 1 MIDTERM, 1 FINAL; 20%)

Each project will have a required 3-5 page paper. The student's paper is meant to outline the hypothesis of interest, dataset, statistical methods, results, and conclusions. **GRADING:**

Hypothesis	4%
Dataset Description	4%
Statistical Methods	4%
Results	4%
Conclusion	4%
TOTAL	**20%**

PROJECT PRESENTATIONS (2 PRESENTATIONS: 1 MIDTERM, 1 FINAL; 10%)

Each project will have a PowerPoint slide presentation or poster presentation. Creativity of the presentation is an important aspect of the presentation. All five parts mentioned in the paper (see project paper grading above) should be included with details. Presentations should mimic a conference speed (poster) presentation. Presentations may be in-person, online synchronous, or online asynchronous. Presentations should be around 10 minutes with 5 minutes of questions. **GRADING:**

Creativity	2%
Project Paper components	5%
Questions	3%
TOTAL	**10%**

Grade Breakdown by group:

Workshop Attendance and Participation: 30%

HW: 30%

Project Proposals: 10%

Project Papers: 20%

Project Presentations: 10%

Grading Scale for Final Grade

Failure to achieve at least a 80% (B-) in the course constitutes failure for purposes of the College of Nursing and the course will have to be retaken

Letter Grade	Grading Scale by Percentages
A	93-100%
A-	90-92.9%
B+	87-89.9%
B	83-86.9%
B-	80-82.9%
C+	77-79.9%
C	73-76.9%
C-	70-72.9%
D+	67-69.9%
D	63-66.9%
D-	60-62.9%
F	<60%

Late Work Policy

Assignments are due by midnight on the date indicated in the course calendar unless otherwise stated. Midnight is based on Eastern Daylight Time/Eastern Standard Time as applicable. This time references the local time in Cincinnati for the duration of the course. If you anticipate a conflict with any of the due dates, please contact the faculty by email to negotiate any changes. Assignments submitted late without prior written approval will receive a score of 0%.

Grade Review

Any question or discussion over the earned points for an examination and/or assignment should be addressed by appealing in writing (email) to the course faculty. Refer to the Student Handbook for additional policies regarding grading.

Withdrawal Policy

Students who wish to withdraw from the course are expected to notify the instructor prior to withdrawal. Students can view withdrawal dates on UC's Academic Calendars site. Students who have satisfactorily completed course requirements up to the date of withdrawal will be eligible for a "W" grade; however, it is the instructor's right to change the "W" to an "F" if it is determined to be warranted through the final grading process. Be sure to refer to UC web registration information regarding other areas that may be affected by course.

Classroom Procedures/Policies

Technology Support

Please review by accessing the link in the *Classroom Procedures, Policies, and Student Resources* module in the Canvas course.

Accessibility Policy

Please review by accessing the link in the *Classroom Procedures, Policies, and Student Resources* module in the Canvas course.

Academic Integrity

Please review by accessing the link in the *Classroom Procedures, Policies, and Student Resources* module in the Canvas course.

Academic Honor Pledge

Please review by accessing the link in the *Classroom Procedures, Policies, and Student Resources* module in the Canvas course.

AI Course Policy

Please review by accessing the link in the *Classroom Procedures, Policies, and Student Resources* module in the Canvas course.

Use generative AI only as a learning aid, not a substitute for your own work. All work submitted must be authored by the student; AI can assist with explanations, brainstorming, or code snippets, but the final text, analysis, and coding must reflect the student's own understanding. Students are responsible for verifying all facts, debugging code, and ensuring originality; failure to comply may result in assignment or course penalties per university policy. Please reach out to me if you have any questions.

Religious Accommodations

Please review by accessing the link in the *Classroom Procedures, Policies, and Student Resources* module in the Canvas course.

Student Resources

Title IX

Please review by accessing the link in the *Classroom Procedures, Policies, and Student Resources* module in the Canvas course.

Sexual Assault Resources

Please review by accessing the link in the *Classroom Procedures, Policies, and Student Resources* module in the Canvas course.

Assignment Directions

Please read the directions carefully on each HW and Project assignment.

Changes to Course Syllabus

This syllabus is merely the instructor's projection of the expected progress through this course. Circumstances may arise that warrant its revision. Should these circumstances arise, this course syllabus may be subject to change. Students will be notified in a timely manner. The instructor also reserves the right to introduce materials not covered in the textbook. For any situation or topic NOT covered in the syllabus, please refer to the Nursing Student Handbook.