UNIVERSITY OF FLORIDA

COLLEGE OF NURSING

COURSE SYLLABUS

Fall 2021

COURSE NUMBER NGR 6840

COURSE TITLE Applied Statistical Analysis I

# CREDITS 3

# PLACEMENT Variable; Required Core Course

# PREREQUISITE NGR 6850 Research Methods and Evidence-based Practice

# or equivalent

# FACULTY Michael Weaver RN PhD FAAN

# Professor & Assoc. Dean for Research & Scholarship

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# COURSE DESCRIPTION This course provides the student with the opportunity to examine procedures for advanced multivariate statistical procedures as applied in research. Emphasis is on the utilization and interpretation of multivariate procedures. An additional emphasis will be on critiquing data analysis in current research articles. The focus is on understanding and applying selected multivariate statistical procedures.

COURSE OBJECTIVES Upon completion of this course, the student will be able to:

1. Critically examine theoretical principles of selected multivariate analyses and their application to nursing research.
2. Compare and contrast selected multivariate statistical methods used to analyze research data.
3. Develop the appropriate statistical design and analysis plan for selected research questions.
4. Utilize diagnostics to determine whether the underlying statistical assumptions are met, and to find outliers or influential cases.
5. Critique data analysis and interpretation of complex results in current research articles.

COURSE SCHEDULE

Faculty Section Day/Time Room

Weaver 2E46 Tuesday/8:30-11:30am HPNP G112

E-Learning in Canvas is the course management system that you will use for this course. E-Learning in Canvas is accessed by using your Gatorlink account name and password at <http://elearning.ufl.edu/>. There are several tutorials and student help links on the E-Learning login site. If you have technical questions call the UF Computer Help Desk at 352-392-HELP or send email to [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).

It is important that you regularly check your Gatorlink account email for College and University wide information and the course E-Learning site for announcements and notifications.

Course websites are generally made available on the Friday before the first day of classes.

TOPICAL OUTLINE

1. General Linear Model statistics
   1. Multiple regression
   2. Repeated Measures ANOVA
   3. Multi-level modeling
2. Probablistic statistics
   1. Logistic Regression
   2. Cox Hazards Regression
   3. Survival Analysis

# TEACHING METHODS

Lectures, readings, computer exercises, and class discussion.

# LEARNING ACTIVTIES

1. Interpretation of findings from analyses
2. Critique of data analysis and interpretation of results in articles reporting research findings.

# FEEDBACK

Unless otherwise advised, emails will be responded to within 2 working days, and feedback on assignments will be provided within 1 week from submission.

# EVALUATION METHODS/COURSE GRADE CALCULATION

Written assignments, examinations, and computer assignments.

* Weekly Exercises: (14 total; each exercise is 3.21%) 45%
* Quizzes (3 Total: 15%, 20%, 20%) 55%

# Total: 100%

MAKE UP POLICY

If lateness is unavoidable, notify the professor **prior to** the scheduled due date/time. **A 15% grade penalty will be assigned for late assignments unless prior approval is obtained**. **No work will be accepted 2 days after the due date.** Tests and quizzes will not be accepted late, and make-up exams/quizzes are not available.

GRADING SCALE/QUALITY POINTS

A 95-100 (4.0) C 74-79\* (2.0)

A- 93-94 (3.67) C 72-73 (1.67)

B+ 91- 92 (3.33) D+ 70-71 (1.33)

B 84-90 (3.0) D 64-69 (1.0)

B- 82-83 (2.67) D- 62-63 (0.67)

C+ 80-81 (2.33) E 61 or below (0.0)

\* 74 is the minimal passing grade

For more information on grades and grading policies, please refer to the Graduate School’s grading policies: <https://catalog.ufl.edu/graduate/regulations/>

COURSE EVALUATION

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

ACCOMMODATIONS DUE TO DISABILITY

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://disability.ufl.edu/> ) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

PROFESSIONAL BEHAVIOR

The College of Nursing expects all Nursing students to be professional in their interactions with patients, colleagues, faculty, and staff and to exhibit caring and compassionate attitudes. These and other qualities will be evaluated during patient contacts and in other relevant settings by both faculty and peers. Behavior of a Nursing student reflects on the student's individual’s ability to become a competent professional Nurse. Attitudes or behaviors inconsistent with compassionate care; refusal by, or inability of, the student to participate constructively in learning or patient care; derogatory attitudes or inappropriate behaviors directed at patients, peers, faculty or staff; misuse of written or electronic patient records (e.g., accession of patient information without valid reason); substance abuse; failure to disclose pertinent information on a criminal background check; or other unprofessional conduct can be grounds for disciplinary measures including dismissal.

UNIVERSITY POLICY ON ACADEMIC MISCONDUCT

Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/> . Students are required to provide their own privacy screen for all examination’s administered to student laptops. No wireless keyboards or wireless mouse/tracking device will be permitted during examinations.

University and College of Nursing Policies

Please see the College of Nursing website for student policies (<http://students.nursing.ufl.edu/currently-enrolled/student-policies-and-handbooks/>) and a full explanation of each of the university policies – (<http://students.nursing.ufl.edu/currently-enrolled/course-syllabi/course-policies>)

Attendance

UF Grading Policy

Religious Holidays

Counseling and Mental Health Services

Student Handbook

Student Use of Social Media

Faculty Evaluations

# REQUIRED TEXTBOOKS

Daniel, WW & Cross CL. (2019). Biostatistics: A foundation for analysis in the health sciences. 11th Edition. Wiley ISBN 978-1119496700 (use of e-book also acceptable).

# REQUIRED SOFTWARE

SAS Version 9.4 or later – Accessible for free via UF APPS (See: <http://info.apps.ufl.edu/>) or contact UF IT for local installation (see <https://www.software.ufl.edu/> - there is a fee for that).

# OTHER SOFTWARE

R: A free software environment for statistical computing and graphics. Available for free download from <https://www.r-project.org/> or through UF APPS.

RSTUDIO: A GUI for running R software. It is available both via UF APPS and as a free download at <https://rstudio.com/products/rstudio/download/> .

RECOMMENDED TEXTBOOKS

While there are no recommended textbooks, it is useful to have on hand several SAS PDF manuals available for free download (information is also available in HELP when running SAS) from the SAS.COM website (<https://support.sas.com/content/support/en/documentation.html>), and videos at <https://video.sas.com/category/videos/how-to-tutorials> . They are useful for both syntax and conceptual understanding of course topics, and will provide information not contained in text. Base SAS and SAS/STAT are the relevant components.

There are numerous free downloads and resources related to using R – see Documentation at <https://www.r-project.org/> ; the “R Resources.docx” file in Topic 01; and <https://www.r-bloggers.com/> .

WEEKLY CLASS SCHEDULE

| DATE | TOPIC/EVALUATION | ASSIGNMENTS/READINGS |
| --- | --- | --- |
| 08/24 | Topic 01  Using UF Apps Stats Software - SAS;  Introduction  Exercise: Text p. 17, #6 | Review PowerPoint slides and MEDIASITE recordings:  Using SAS Intro Part 1 (Slides 1-11)  Set-up, accessing in UF APPS, and file definitions   * **See CANVAS site for Link to recording**   Using SAS Intro Part 2  SAS Program-Related Definitions  SAS Program-Related Definitions (Slides 12 – 20)  Using SAS Intro Part 3  Running analyses and using other capabilities (Slides 21-29)   * **See CANVAS site for Link to recording**   Read Text Chapter 1 |
| 08/31 | Topic 02  Descriptive Statistics  Exercise: Text p. 54, # 16 | Watch recorded lecture.  Read Text Chapter 2 |
| 09/07 | Topic 03  Probability & Probability Distributions  Exercises:  Text p. 74, #3.5.2  Text p. 116 #20 | Watch recorded lecture.  Read Text Chapters 3 & 4 |
| 09/14 | Topic04  Sampling Distributions  Exercises:  Text pp. 140 & 141: #6, 10, 12, 14, 16 | Watch recorded lecture.  Read Text Chapter 5 |
| 09/21 | Topic 05  Estimation  Exercises:  Text p. 184 # 14, 17 20, 21, 24 | Watch recorded lecture.  Read Text Chapter 6 |
| 09/28 | Topic 06  Hypothesis Testing  Exercises:  Text pp. 254-287 # 19, 22, 31, 33  Quiz 01 | Watch recorded lecture.  Read Text Chapter 7 |
| 10/05 | Topic 07  Non-parametric and distribution-free Statistics  Exercises:  Text p. 610 # 13.7.2 & 638, #9 | Watch recorded lecture  Read Text Chapter 13 |
| 10/12 | Topic 08  Analysis of frequencies  Exercises:  Text p. 572 #16, 17, 19 | Watch recorded lecture.  Read Text Chapter12 |
| 10/19 | Topic 09  Simple correlation and regression  Exercises:  Text p. 402 #18 & 19 | Watch recorded lecture.  Read Text Chapter 9 |
| 10/26 | Topic 10  Hypotheses about means: ANOVA  Exercises:  Text p. 344 #47 | Watch recorded lecture.  Read Text Chapter 8 |
| 11/02 | Topic 11  Multiple regression & the General Linear Model  Exercises:  Text p 449 #8  General Linear Model Exercise  Quiz 02 | Watch recorded lecture.  Read Text Chapters 10 and 11.1-11.3 |
| 11/09 | Topic 12  Logistic Regression  Exercises:  Text p. 495 #11.4.2 | Watch recorded lecture.  Read Text Chapter 11 Section 11.4 |
| 11/16 | Topic 13  Multi-Level Modeling  Multi-Level Modeling Exercise | Watch recorded lecture.  Review information at: <http://www.bristol.ac.uk/cmm/learning/multilevel-models/what-why.html>  Read example application here: <http://www.stat.columbia.edu/~gelman/research/published/multi2.pdf>  Read “Introduction to Mixed Modeling Procedures” – SAS/STAT User’s Guide;  Review “The MIXED Procedure” – SAS/STAT User’s Guide |
| 11/23 | Topic 14  Survival Analysis  Exercises:  Text p.668 #11 | Watch recorded lecture.  Read Text Chapter 14 (14.1-14.4), and review (to get an idea of survival analyses available in SAS) “Introduction to Survival Analysis Procedures”, “The ICLIFETEST Procedure”, “The ICPHREG Procedure”, “The LIFETEST Procedure”, and “The PHREG Procedure” chapters in the SAS/Stat User’s Guide. For the individual procedure chapters, read the “Overview” sections to get an idea of capabilities and how each procedure compares to others. |
| 11/30 | Topic 14 Continued  Cox Proportional Hazards Model  Exercises  Cox Proportional Hazards Exercise | Watch recorded lecture.  Read Text Chapter 14 (14.5) and <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC478551/pdf/1409-03.pdf> , read “The PHREG Procedure” and “The ICPHREG Procedure” chapters in the SAS/STAT User’s Guide – this time more in-depth, to get an idea of how to use the procedures… |
| 12/07 | Last Class – Wrap-up, questions  Quiz # 3 |  |

Approved: Academic Affairs Committee: 10/97; 07/03, 01/05, 10/08

Faculty: 12/97; 07/03, 01/05. 11/08

UF Curriculum: 06/99