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| <br><b>FLORIDA ATLANTIC UNIVERSITY</b>  | <b>NEW COURSE PROPOSAL</b><br><b>Graduate Programs</b>  |  | UGPC Approval _____<br>UFS Approval _____<br>SCNS Submittal _____<br>Confirmed _____<br>Banner Posted _____<br>Catalog _____ |   |
|  | Department Nursing<br>College Nursing<br>(To obtain a course number, contact <a href="mailto:erudolph@fau.edu">erudolph@fau.edu</a> ) |  |  |   |
| Prefix NGR<br>Number 7845  | (L = Lab Course; C = Combined Lecture/Lab; add if appropriate)<br>Lab Code  | Type of Course<br>Lecture  | Course Title<br>Applied Advanced Statistics  |   |
| Credits (Review Provost Memorandum)<br>3   | Grading (Select One Option)<br>Regular <input checked="" type="radio"/><br>Sat/UnSat <input type="radio"/>                            | Course Description (Syllabus must be attached; see Guidelines)<br>Focuses on advanced statistical concepts and research strategies for knowledge development in the discipline of nursing and health sciences with an emphasis on longitudinal analyses. |  |   |
| Effective Date (TERM & YEAR)<br>Summer, 2019   | Prerequisites<br>NGR 7815; NGR 7818   |  | Corequisites<br>None   | Registration Controls (Major, College, Level) |
| Prerequisites, Corequisites and Registration Controls are enforced for all sections of course  |   |  |  |   |
| Minimum qualifications needed to teach course:<br>Member of the FAU graduate faculty and has a terminal degree in the subject area (or a closely related field.) |   | List textbook information in syllabus or here<br>see syllabus  |  |   |
| Faculty Contact/Email/Phone<br>Christine Williams<br>cwill154@health.fau.edu<br>561 297 0005   |   | List/Attach comments from departments affected by new course   |  |   |

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| <b>Approved by</b><br>Department Chair <u>Christine Williams</u><br>College Curriculum Chair <u>[Signature]</u><br>College Dean <u>[Signature]</u><br>UGPC Chair _____<br>UGC Chair _____<br>Graduate College Dean _____<br>UFS President _____<br>Provost _____ | <b>Date</b><br>_____<br>10/25/18<br>_____<br>_____<br>_____<br>_____<br>_____ |
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Email this form and syllabus to [UGPC@fau.edu](mailto:UGPC@fau.edu) one week before the UGPC meeting.

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**FLORIDA ATLANTIC UNIVERSITY  
CHRISTINE E. LYNN COLLEGE OF NURSING  
COURSE SYLLABUS FOR INFERENTIAL STATISTICS  
Summer 2019**

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|--|--|
| <b><u>COURSE NUMBER:</u></b>           | NGR 7845   |
| <b><u>COURSE TITLE:</u></b>            | Applied Advanced Statistics  |
| <b><u>COURSE FORMAT:</u></b>           | Weekly in-person meetings with a WebEx option  |
| <b><u>CREDIT HOURS:</u></b>            | 3 Credit Hours   |
| <b><u>COURSE SCHEDULE:</u></b>         | Class meets weekly   |
| <b><u>PLACEMENT IN CURRICULUM:</u></b> | Research core course; Second semester of year two  |
| <b><u>PREREQUISITES:</u></b>           | NGR 7815; NGR 7818; NGR 7822; NGR 7817   |
| <b><u>COREQUISITES:</u></b>            | None   |
| <b><u>FACULTY:</u></b>                 | David Newman, Ph.D.<br>Associate Professor<br>Christine E Lynn College of Nursing, Room 215E<br>Office Phone: (561) 297-2607<br>E-mail: <a href="mailto:dneman14@health.fau.edu">dneman14@health.fau.edu</a> |
| <b><u>OFFICE HOURS:</u></b>            | Immediately Following Class each Month; 2-4pm Tuesday's; &<br>By Appointment   |

**COURSE DESCRIPTION:** This the second interdisciplinary course focuses on advanced statistical concepts and research strategies for knowledge development in the discipline of nursing and health sciences with a focus on longitudinal analyses. Students will identify and conduct analyses that appropriately correspond with selected longitudinal research designs using statistical techniques such missing data analysis, imputations, bootstrapping, sensitivity analysis, longitudinal data collection strategies with analytical techniques of generalized linear mixed modes, growth models, generalized estimation of equations, survival and analysis. Students will adapt repeated measures, ANOVA and MANOVA to fit with a theoretical construct using linear growth models with structural equation modeling.

**COURSE OBJECTIVES:** The course objectives are based on Simone Roaches' (2002)<sup>1</sup> attributes of caring. Upon completion of the course, the student will demonstrate evidence of:

**Becoming Competent**

1. Select appropriate innovative longitudinal methodologies used to develop evidence base for caring science.

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2. Critically evaluate longitudinal research that employs innovative advanced statistical methods.

### **Becoming Compassionate**

3. Design research that integrates participant uniqueness with appropriate longitudinal research methodologies and analyses of complex situations.

### **Demonstrating Comportment**

4. Demonstrate caring behaviors in collaborative work on data-based projects.
5. Identify and describe interprofessional collaboration that will be required to accomplish research studies.
6. Analyze the components necessary for application of longitudinal research methods

### **Becoming Confident**

7. Demonstrate essential methodological expertise required to conduct longitudinal research studies by identifying the most appropriate research design and statistical analyses under varying constants.

### **Attending to Conscience**

8. Integrate protection of human subjects into innovative designs to advance nursing science.

<sup>1</sup>Roach, M.S. (2002). *Caring, the human mode of being: A blueprint for the health professions*. Ottawa, ONT: CHA Press. ISBN-10 1896151422.

### **TEACHING LEARNING STRATEGIES:**

- ❖ Lecture/Canvas Assignments
- ❖ Written Assignments
- ❖ Class discussion/Group work
- ❖ Application of class materials
- ❖ Problem-solving and critical thinking
- ❖ Specific behavioral objectives given to students and tied directly to course goals and test items

**GRADING AND EVALUATION METHODS: Students are required to complete all course assignments. All assignments are due on the designated due date.**

### **3 SPSS Assignments= 30 points of course grade**

There will be three SPSS assignments covering the areas of Missing data analysis, Imputations, generalized linear mixed models (GLMM), generalized estimation of equations (GEE), Survival Analysis (Cox Regression), regression discontinuity analysis (DA), and longitudinal structural equation Modeling (SEM)

*2- Tests = 200 points of course grade*

The two tests will focus on practical application of the material covered during the class.

*Collaborative Group Project = 200 points of course grade*

The collaborative group project is a simulated research project where students select a group based on similar interests. They then write a small purpose, problem and methods section, create a simulated data set, run the analysis, and write-up the results and conclusions. The goal is to align the purpose problem, research questions, and research design with the correct statistical models. Check the project rubric for the section to include in the project. There is no review of the literature except justification of statistical techniques.

*Presentation of Project = 30 points of course grade*

All groups will give a presentation of their collaborative projects in a 15 minute conference format (probably PowerPoint). Question sessions from students and the professor will follow directly after the presentation.

*Critique of Quantitative Study = 25 points of course grade*

A critique of a quantitative longitudinal research study will be completed. Each student has to find an appropriate peer reviewed journal article and report on the purpose, methods, statistical technique, design, and whether or not all aspects were aligned. Students will complete the Journal Critique Sheet in its entirety, score it, and report on the article's potential for acceptance as if the student were a reviewer.

*Instructor & Group participation score = 15 points of course grade*

Learning is a collaborative and interactive activity. Therefore, come to class prepared to participate. You are a vital aspect of the learning environment and students learn for other student's questions, comments and experiences. BE PREPARED TO SHARE

**TOTAL = 500 Points**

### **Criteria Used in Grading Written Work**

- See Rubric for each of the above course assignments



**GRADING SCALE: Please Note: A grade below C is not passing in the Graduate Program.**

93-100 = A  
90-92 = A-  
87-89 = B+  
83-86 = B  
80-82 = B-  
77-79 = C+  
73-76 = C  
70-72 = C-  
67-69 = D+  
63-66 = D  
60-62 = D-  
0-59 = F

**REQUIRED TEXTBOOKS:**

1. Little, T. (Ed.), Schnabel, K. (Ed.), Baumert, J. (Ed.). (2000). *Modeling Longitudinal and Multilevel Data*. New York: Psychology Press.
2. Heck, R. H., Tabata, L., & Thomas, S. L. (2013). *Multilevel and longitudinal modeling with IBM SPSS*. Routledge.

**RECOMMENDED TEXTBOOKS:** None

**Topic: Longitudinal Data Analysis**

Justification: Many of the studies that both our students and our faculty do are some form of longitudinal design. The complexity of these designs varies depending on the sophistication of the researcher and intricacy of the research study. Even though our students have been exposed to some of the designs listed below, they have not explored them fully not considered issues with data collection, tracking participants over time and the various types of statistical analyses with each ones strengths and weaknesses. This class is appropriate for advanced Ph.D. students and open to postdoctoral fellows and faculty from the college of nursing, and others with permission of faculty

**TOPIC OUTLINE**

1. Different Research Designs
  - a. RM-Factorial ANOVA Design
  - b. Cross-sectional
  - c. Cohorts
  - d. Interrupted time series
  - e. RD Designs
  - f. AB/ BA Crossover designs
  - g. Survival Analysis

2. Data Collection Considerations: Missing Data
  - a. Missing Data Analysis
  - b. Methods for Addressing Missing Data
    - i. Data Imputations
    - ii. Bootstrapping
  - c. Three General Recommendations for Dealing with Missing Data
    - i. Make explicit the assumptions of any methods used to cope with missing data for example, that the data are assumed missing at random, or that missing values were assumed to have a particular value such as a poor outcome.
    - ii. Perform sensitivity analyses to assess how sensitive results are to reasonable changes in the assumptions that are made
    - iii. Address the potential impact of missing data on the findings in the Discussion section
  - d. Data Collection Techniques
    - i. Direct administration of a questionnaire or survey
    - ii. Mail
    - iii. Online
    - iv. Telephone
    - v. Interview
    - vi. Archival
3. Strategies for tracking People over Time. Especially Over Multiple Years
  - a. Technology for Tracking Individuals that Move.
  - b. Money and Resources
4. Data Analysis
  - a. Paired Sample t-test (Review)
  - b. Repeated measures ANOVA (Review)
  - c. Regression with Person Vectors
  - d. HLM & General Linear Mixed Models
  - e. Generalized Estimating Equations (GEE)
  - f. Regression Discontinuity
  - g. Survival Analysis
    - i. Kaplan Meier
    - ii. Cox Regression
  - h. Repeated Measures Structural Equation Models

## COURSE POLICIES AND GUIDELINES

### 1. ATTENDANCE:

- Absence from class: Although things occasionally cause one to miss class greater than 1 absence will result in the lowering of one letter grade unless previously approved with the professor.
- Tardiness does not demonstrate good professional behavior and is distracting to other students; more than 2 incidents will result in the lowering of a letter grade.
- Responsibility for obtaining the missed content rests with the student.

## 2. COURSE ASSIGNMENTS:

- All assignments are to be submitted by the due date/time as noted in the syllabus.
- Late Assignments: Prior arrangements should be made with the professor when submitting assignments beyond the identified due date. Please communicate via email when requesting to submit a late assignment. Assignments submitted more than 24 hours beyond the due date, when prior arrangements have not been made with the professor, will receive a C- for that assignment.

### 1. USE OF ELECTRONIC AND PERSONAL COMMUNICATION DEVICES IN THE CLASSROOM: Is disruptive. Therefore, please turn them to silent. Thank You

### 2. GUIDELINES FOR PARTICIPATION IN CLASS: Each student is expected to make *substantive* contributions to class/course discussions. Contributions should reflect understanding of assigned readings and scholarly preparation for each class/seminar session. Appropriate participation would include but not be limited to the following behaviors:

- Discusses opinion other than own.
- Compares and contrasts implications of various aspects of research.
- Cites sources (literary or other) of ideas and concepts.
- Suggests references for different or more involved points, being ready to provide the necessary bibliographic data.
- Encourage others to share knowledge and experiences, i.e., does not monopolize discussions.
- Discusses recent developments in the field (Research).
- Clarifies thinking by identifying reasons for questions.
- Encourages others to ask questions, disagree, express own views, and/or act in the role of "devil's advocate" to help clarify own thinking.
- Acknowledges others' questions and responses, or pursues the responses toward clarification.
- Raises challenging questions and/or problems for discussion.

NOTE: These are some of the basic rules of participation expected during professional meetings. As graduates you will be expected to be leaders. The classroom provides a realistic forum for practice. Practiced regularly, these guidelines generally help the learner to become comfortable with peer critique.

**3. All course requirements and objectives must be met in order to earn a passing grade.**

### **COLLEGE OF NURSING AND UNIVERSITY POLICIES:**

Policies below may be found in:

- a). The faculty reserves the right to make changes in course content and requirements.
- b). The Christine E. Lynn College of Nursing Graduate Handbook located at:  
<http://nursing.fau.edu/index.php?main=3&nav=457>
- c). Florida Atlantic University's Academic Policies and Regulations:  
<http://www.fau.edu/academic/registrar/catalogRevs/academics.php> and  
<http://www.fau.edu/regulations>

### **CODE OF ACADEMIC INTEGRITY**

The University policy regarding academic integrity is enforced in this course. Students at Florida Atlantic University are expected to maintain the highest ethical standards. Dishonesty is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see:  
[http://www.fau.edu/regulations/chapter4/4.001\\_Code\\_of\\_Academic\\_Integrity.pdf](http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf)

The College of Nursing regards adherence to the Code of Academic Integrity as a professional competency and an expectation of all students. **ANY** act of dishonesty that violates the code of academic integrity and misrepresents your efforts or ability is grounds for immediate failure of the course.

### **DISABILITY STATEMENT:**

In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca Raton – SU 133 (561-297-3880), in Davie – MOD 1 (954-236-1222), in Jupiter – SR 117 (561-799-8585) or at the Treasure Coast – CO 128 (772-873-3305), and follow all OSD procedures.

### **COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS) CENTER**

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS



provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>

### **INCOMPLETE POLICY:**

The Incomplete Grade Policy is enforced. Any student who registers for a course but fails to complete the course requirements, without dropping the course, will normally receive a grade of “F” from the course instructor. A student who is passing a course but has not completed all the required work because of exceptional circumstances may, with the approval of the instructor, temporarily receive a grade of “I” (incomplete). This must be changed to a grade other than “I” within a specified time frame, not to exceed one calendar year from the end of the semester during which the course was taken.

### **ATTENDANCE POLICY:**

Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of nonattendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations, or participation in University-approved activities. Examples of University approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances, and debate activities. It is the student’s responsibility to give the instructor notice prior to any anticipated absence and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student’s final course grade as a direct result of such absence.

### **RELIGIOUS ACCOMMODATION**

In accordance with rules of the Florida Board of Education and Florida law, students have the right to reasonable accommodations from the University in order to observe religious practices and beliefs with regard to admissions, registration, class attendance, and the scheduling of examinations and work assignments. Students who wish to be excused from coursework, class activities, or examinations must notify the instructor in advance of their intention to participate in religious observation and request an excused absence. The instructor will provide a reasonable opportunity to make up such excused absences. Any student who feels aggrieved regarding religious accommodations may present a grievance to the director of Equal Opportunity Programs. Any such grievances will follow Florida Atlantic University’s established grievance procedure regarding alleged discrimination.

### **USE OF STUDENT COURSE MATERIAL**

The Christine E. Lynn College of Nursing may use students’ course-related materials for legitimate institutional purposes, such as accreditation, university review process, or state board

of nursing review process, etc. In such cases, materials will be used within the college and university.

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CHRISTINE E. LYNN COLLEGE OF NURSING

### STATEMENT OF PHILOSOPHY

Nursing is a discipline of knowledge and professional practice grounded in caring. Nursing makes a unique contribution to society by nurturing the wholeness of persons and environment in caring. Caring in nursing is an intentional mutual human process in which the nurse artistically responds with authentic presence to calls from persons to enhance well-being. Nursing occurs in nursing situations: co-created lived experiences in which the caring between nurses and persons enhance well-being. Nursing is both science and art. Nursing science is the evolving body of distinctive nursing knowledge developed through systematic inquiry and research. The art of nursing is the creative use of nursing knowledge in practice. Knowledge development and practice in nursing require the complex integration of multiple patters of knowing. Nurses collaborate and lead interprofessional research and practice to support the health and well-being of persons inextricably connected within a diverse global society.

Persons as participant in the co-created nursing situation, refers to individual, families or communities. Person is unique and irreducible, dynamically interconnected with others and the environment in caring relationships. The nature of being human is to be caring. Humans choose values that give meaning to living and enhance wellbeing. Well-being is creating and living the meaning of life. Persons are nurtured in their wholeness and well-being through caring relationships.

Beliefs about learning and environments that foster learning are grounded in our view of person, the nature of nursing and nursing knowledge and the mission of the University. Learning involves the lifelong creation of understanding through the integration of knowledge within a context of value and meaning. A supportive environment for learning is a caring environment. A caring environment is one in which all aspects of the person are respected, nurtured and celebrated. The learning environment supports faculty-student relationships that honor and value the contributions of all and the shared learning and growth.

The above fundamental beliefs concerning Nursing, Person and Learning express our values and guides the actions of Faculty as they pursue the missions of teaching, research/scholarship and service shared by the Christine E. Lynn College of Nursing and Florida Atlantic University.

\*Revised April, 2012.

DRAFT

| Weeks | DATES | TOPIC  | READ LIST REVIEW   | TO DO                                   |
|-------|-------|--|--|---|
| 1     |       | Intro to Repeated Measures and Longitudinal Data Analysis          |  | • Pretest                               |
| 2     |       | Different Types of RM and Longitudinal Designs                     | Reading List   | •                                       |
| 3     |       | Missing Data Analysis and Imputations                              | SPSS Missing Data Analysis Manual                                | • Homework 1 Data Imputations           |
| 4     |       | Bootstrapping with Robust Errors & Data Collection techniques      |  | • Class Project on Bootstrapping        |
| 5     |       | Review on simple matched pairs, RM ANOVA and Multivariate RM ANOVA | Andy Field Chapter 18<br>Steven's RM Chapter 16                  | • Research Critique 1<br>• Work on CH 3 |
| 6     |       | Multiple Linear Regression and Simple Linear mixed Model Review    | Newman (1-3) Articles<br>Field CH 8 and 20                       | • Homework 2                            |
| 7     |       | Regression Discontinuity Designs                                   | Newman, Newman and Schumacher (2013)                             | •                                       |
| 8     |       | Generalized Estimation of Equations                                | Video  | •                                       |
| 9     |       | Survival Analysis  | MANOVA And Others Multivariate                                   | • Homework 3                            |
| 10    |       | Data Coding Discussion and Test 1                                  |  | Test 1                                  |
| 11    |       | Path Analysis with AMOS  | Discriminate Function Analysis & Multinomial Logistic Regression |   |
| 12    |       | Structural Equation Modeling AMOS                                  | GLMM HLM   |   |
| 13    |       | SEM Continued)   |  | •                                       |
| 14    |       | Repeated Measures Structural Equation Models.                      |  | •                                       |
| 15    |       | Data Management Systems for tracking longitudinal data             |  | •                                       |
| 16    |       | Finals   |  | •                                       |

**Note. Class topics might change based on student's needs and questions**

**From:** Lianfen Qian  
**Sent:** Wednesday, October 31, 2018 11:06 AM  
**To:** Christine Williams <[cwill154@health.fau.edu](mailto:cwill154@health.fau.edu)>  
**Subject:** RE: new statistics course

Dear Christine,

Sorry for the belated response. I briefly looked through your course proposal, it looks good except the followings:

1. The long list of required textbooks will hurt the student affordability performance metric.
2. The long list of required textbooks focuses mainly on multilevel models rather than longitudinal data analysis.

Hence it will be reasonable to make changes of the course coverage in the course description to reflect the required materials.

Let me know if I can be any further help.

Thanks,  
Lianfen

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