UNIVERSITY OF FLORIDA

COLLEGE OF NURSING

COURSE SYLLABUS

Spring 2016

COURSE NUMBER NGR 6840 – Sections 21CC, 1425, 143B, 18F4

COURSE TITLE Applied Statistical Analysis I

CREDITS 3

PLACEMENT Variable; Required Core Course

# PREREQUISITE NGR 6850 Research Methods and Evidence-Based Practice or equivalent

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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

Section Day/Time/Room 3051 Web-based (asynchronous)

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 <https://lss.at.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. Probabilistic statistics
   1. Logistic Regression
   2. Cox Hazards Regression
   3. Survival Analysis

TEACHING METHODS

Lecture, audiovisual materials, written materials, computer exercises, written assignments, and online class discussions/activities.

LEARNING ACTIVITIES

Readings, watching YouTube and other online videos, working with assigned teams, homework assignments from course text, programming in JMP and scientific writing through interpretation of statistical analyses in JMP assignments.

EVALUATION METHODS/COURSE GRADE CALCULATION

* Homework from Textbook and JMP Assignments: 30%
* Weekly Team Report: 10% *[Note: Full points are given for* ***posting*** *the Team Report]*
* Weekly Quizzes (30%) and Competency Checks (5%): *[Note: Full points are given for* ***completing*** *the Weekly Competency Check, a self-report of your learning progress]*
* Final Exam: 25%

MAKE UP POLICY

If lateness is unavoidable, notify the professor **prior to** the scheduled due date/time. **A 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 University’s grading policies: http://gradcatalog.ufl.edu/content.php?catoid=4&navoid=907#grades.

University and College of Nursing Policies:

Please see the College of Nursing website for a full explanation of each of the following policies - <http://nursing.ufl.edu/students/student-policies-and-handbooks/course-policies/>.

Attendance

Academic Honesty

UF Grading Policy

Accommodations due to Disability

Religious Holidays

Counseling and Mental Health Services

Student Handbook

Faculty Evaluations

Student Use of Social Media

REQUIRED TEXTBOOK

# *Introductory Applied Biostatistics* (with CD-ROM) Hardcover – March 16, 2005

by  [Ralph D'Agostino](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&field-author=Sr.++Ralph+D%27Agostino&search-alias=books&text=Sr.++Ralph+D%27Agostino&sort=relevancerank), [Lisa Sullivan](http://www.amazon.com/s/ref=dp_byline_sr_book_2?ie=UTF8&field-author=Lisa+Sullivan&search-alias=books&text=Lisa+Sullivan&sort=relevancerank), [Alexa Beiser](http://www.amazon.com/s/ref=dp_byline_sr_book_3?ie=UTF8&field-author=Alexa+Beiser&search-alias=books&text=Alexa+Beiser&sort=relevancerank)

# Additional readings and YouTube video watching will be assigned in E-learning/Canvas.

REQUIRED SOFTWARE: JMP

WEEKLY CLASS SCHEDULE

* JMP programming will be incorporated into weekly assignments.
* Assignments are due on the date assigned by 11:59 pm.

WEEKLY CLASS SCHEDULE: **Assignments. Quizzes, and Team Reports are due on the date assigned by 11:59 pm**. Note 1: Students are ***encouraged*** to work together on homeworks. Note 2: Quiz questions will come from a bank of questions and will vary from student to student. Students will have **one hour** to complete a quiz once it is started. You may use your book and notes for quizzes, **but you may not have any help to take the quiz**.

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| **Module**  **Week** | **Topic** | **Textbook Assignment**  **Chapter** | **Recorded Lectures (LEC) and**  **YouTube (YT) Video Assignments (YT links below)** | **Textbook Homework Assignment** | **Additional Assignments** | **Due date for textbook**  **assignment, quiz, competency check, team report** |
| 1  1/5/16 | Summarizing Data and Introduction to JMP | Chapter 1 and  Chapter 2 | LEC 1.1  LEC 1.2 | 1. Answer questions p. 71 2. Sec 2.6 Problems: #8, #10, #12abcd, #25 | **Take Team Formation Qualtrics Survey (Due 1/6/2016) [Note: do not use phone to take survey]**  JMP 1  Team Report 1 | 1/12/16 |
| 2  1/11/16 | Probability | Chapter 3 | LEC 2,  YT2.1, YT 2.2 | Sec 3.9 Problems:  #1, #2, #4, #11 | JMP 2  Team Report 2 | 1/19/16 |
| 3  1/18/16 | Finding Normal Probabilities and  Sampling Distributions | Chapter 4 | YT 3.1, YT 3.2 | Sec 3.9 Problem: #29  Sec 4.9 Problems:  #1, #2, #4, #6, #11 | JMP 3  Team Report 3 | 1/26/16 |
| 4  1/25/16 | Statistical Inference: Procedures for  | Chapter 5 | YT 4.1, YT 4.2 | Sec 5.6 Problems:  #1, #4, #8, #19, #23, #24, #34 | JMP 4  Team Report 4 | 2/02/16 |
| 5  2/01/16 | Statistical Inference: Procedures for ( | Chapter 6 | YT 5 | Sec 6.6 Problems:  #1, #2, #13a, #25ab | JMP 5  Team Report 5 | 2/09/16 |
| 6  2/08/16 | Categorical Data | Chapter 7 | YT 6.1, YT 6.2 | Sec 7.10 Problems:  #2, #4, #27 | JMP 6  Team Report 6 | 2/16/16 |
| 7  2/15/16 | Comparing Risks in Two Populations | Chapter 8 | LEC 7 |  | JMP 7  Team Report 7 | 2/23/16 |
| 8  2/22/16 | Analysis of Variance | Chapter 9 | YT 8 | Sec 9.10 Problems:  #2, #3, #4, #11 | JMP 8  Team Report 8 | 2/30/16 |
| 9  2/29/16 | Correlation and Regression | Chapter 10 | YT 9 |  | JMP 9  Team Report 9 | 3/08/16 |
| 10  3/07/16 | **SPRING BREAK** | | | | | |
| 11  3/14/16 | Regression | Chapter 10 | LEC 11 |  | JMP 11  Team Report 11 | 3/22/16 |
| 12  3/21/16 | Logistic Regression | Chapter 11 | LEC 12 |  | JMP 12  Team Report 12 | 3/29/16 |
| 13  3/28/16 | Logistic Regression | Chapter 11 | LEC 13 |  | JMP 13  Team Report 13 | 4/05/16 |
| 14  4/04/16 | Nonparametric Tests | Chapter 12 | LEC 14 |  | JMP 14  Team Report 14 | 4/12/16 |
| 15  4/11/16 | Introduction to Survival Analysis and Multilevel Modeling | Chapter 13 | LEC 15 | Practice exam (not to be handed in) | Critique of Manuscript  (Team Project)  Team Report 15 | **4/19/16** |
| 16  **4/18/16** | **REVIEW and Practice Final Exam** | | | | | |
|  | ***FINAL EXAM:*** *This will be a web-based, open-book exam. Because the exam is open book, we will not use Proctor U for this exam. The exam will be administered in Canvas. The* ***exam will be open for a 24-hour period****:* ***Exam opens at 8:00 am on Monday, April 25, 2016. Exam closes at 8 am on Tuesday, April 26, 2016. Please plan your schedules accordingly.*** *Once you open the exam, you will have* ***2 hours*** *to complete it. You will be bound by the UF Honor Code.* ***You may use your book, notes, and Internet, but may not receive help from others.*** | | | | | |

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| **Week** | **Topic** | **Links for YouTube Videos along with playing time (in parentheses)**  **Links are also given on CANVAS course site** |
| 1  1/5/16 | Summarizing Data and Introduction to JMP | LEC 1.1: Intro to the Big Picture of Statistics  LEC 1.2: Intro to JMP and working with a dataset  YT 1: <https://www.youtube.com/watch?v=NM_iOLUwZFA> (8:31)  <https://www.youtube.com/watch?v=Cx2tGUze60s> (12:11) |
| 2  1/11/16 | Probability | LEC 2: Probability  YT 2.1: <https://www.youtube.com/watch?v=pV3nZAsJxl0> (10:44)  YT 2.2: <http://www.jbstatistics.com/introduction-to-discrete-random-variables-and-discrete-probability-distributions/> 1.1 (14:10) <http://www.jbstatistics.com/introduction-to-the-binomial-distribution/> 1.5 (14:10)  YT 2.3: <http://www.jbstatistics.com/continuous-random-variables-continuous-probability-distributions/> : 2.1 (5:51), 2.5 (5:57), 2.8 (12:80), 2.9 (5:28), 2.10 (6:10), 2.11 (4:03) |
| 3  1/18/16 | Finding Normal Probabilities  and  Sampling Distributions | YT 3.1: <https://www.youtube.com/watch?v=EhUvGRddC4M> (8:07) <http://www.jbstatistics.com/standardizing-normally-distributed-random-variables/>: 2.6 (10:27) <http://www.jbstatistics.com/finding-areas-using-the-standard-normal-table-for-tables-area-to-left-of-z/>: 3.1 (6.15) <http://www.jbstatistics.com/finding-percentiles-using-the-standard-normal-table-for-tables-that-give-the-area-to-left-of-z/> 3.2 (7.32)  YT 3.2: <http://www.jbstatistics.com/sampling-distributions/> : 4.1 (7:51), 4.2 (11:39), 4.3 (13:13) |
| 4  1/25/16 | Statistical Inference: Procedures for  | YT 4.1: <http://www.jbstatistics.com/confidence-intervals/> : 5.1 (6.41), 5.2 (6.39), 5.3 (10:35), 5.4 (5:36), 5.5 (6:00), 5.6 (4:04), 5.7 (9:45), 5.8 (8:54), 5.9 (5:14), 5.10 (8:56)  YT 4.2: <http://www.jbstatistics.com/hypothesis-testing/> : 6.1 (9.53), 6.2 (11:12), 6.3 (10:22),  6.4 (10:01), 6.5 (8:10), <http://www.jbstatistics.com/what-is-a-p-value/> (10:50), 6.7 (8:10), 6.8 (9:24), 6.9 (4:46), 6.10 (5:35), 6.11 (11:31), 6.13 (12:24), 6.15 (13:45). 6.16 (9:42), 6.17 (7:53), 6.18 (6:57) |
| 5  2/01/16 | Statistical Inference: Procedures for ( | YT 5: <http://www.jbstatistics.com/inference-for-two-means/> : 7.1 (6:20), 7.2 (10:07), 7.3 (11:03), 7.4 (12:40), 7.5 (9:41). 7.6 (10:12), 7.7 (11:51), 7.8 (8:33), 7.9 (12:05), 7.10 (9:58) |
| 6  2/08/16 | Categorical Data | YT 6.1: <http://www.jbstatistics.com/inference-for-proportions/> : 8.1 (10:26), 8.2 (9:48), 8.3 (8:39), 8.4 (11:21), 8.5 (15:09), 8.6 (13:23)  YT 6.2: <http://www.jbstatistics.com/chi-square-tests/>: 9.1 (9:06), 9.3 (9:53), 9.4 (5:13) |
| 7  2/15/16 | Comparing Risks in Two Populations | LEC 7: Comparing Risks in Two Populations |
| 8  2/22/16 | Analysis of Variance | YT 8: <http://www.jbstatistics.com/anova/> : 11.1 (5:43), 11.2 (9:06), 11.3 (5:25), 11.4 (8:37),  11.5 (4:51) |
| 9  2/29/16 | Correlation and Regression | YT 9: <http://www.jbstatistics.com/regression/> : 12.1 (8:08), 12.2 (7:23), 12.3 (5:04), 12.4 (3:04), 12.5 (8:03), 12.6 (6:57), 12.7 (7:00), <https://www.youtube.com/watch?v=dCgIavyFWIo> (6:16), 12.9 (9:50), 12.10 (5:24), 12.11 (7:26), 12.12 (12:26), 12.13 (7:14), 12.14 (5:45) |
| 11  3/14/16 | Regression | LEC 11: Multiple Regression |
| 12  3/21/16 | Logistic Regression | LEC 12: Logistic Regression Part 1 |
| 13  3/28/16 | Logistic Regression | LEC 13: Logistic Regression Part 2 |
| 14  4/04/16 | Nonparametric Tests | LEC 14: Nonparametric |
| 15  4/11/16 | Introduction to Survival Analysis and Multilevel Modeling | LEC 15: Introduction to Survival Analysis and Multilevel Modeling |