DUKE UNIVERSITY SCHOOL OF NURSING

Course Number & Title: N911 Introductory Statistics

Course Description:
This course explores fundamental knowledge of statistical principles and commonly used univariate and bivariate analyses in health and behavioral sciences. Topics include levels of measurement, descriptive statistics, sampling distribution, parameter estimation, hypothesis testing, t-tests, one-way ANOVA, non-parametric tests, correlation, simple regression, and power and effect size. This course also provides students the opportunity to learn basic data management skills. Assignments provide students with hands-on data analytic experience with relevant statistical software.

Enrollment Eligibility: Permission of the instructor or the director of the PhD Program

General Information:

Credits:	3 credits
Semester:	Fall semester, 2025
Time & Location:	Lecture (Thur 9:00am-11:50am, IPE 4295)
Faculty:	Qing Yang, Ph.D. (qing.yang@duke.edu)

Statement on Inclusion and Belonging
Consistent with Duke University School of Nursing's mission statement, we are all responsible for maintaining a positive, respectful, and inclusive environment. Every student, faculty, and staff member has the right to inclusion, respect, agency, and voice within the DUSON and Duke community. By embracing all lived experiences, as called for in the American Nurses Association Code of Ethics, we strengthen our community, pedagogy, research, practice and the future design, development, and delivery of health care that eliminates disparities both locally and globally.

If at any time a student does not feel supported, or has experienced or observed unfair treatment, they are encouraged to speak out for justice and support within the moment or after the moment has passed. If you experience discrimination, harassment, or sexual misconduct you may report it to the Office for Institutional Equity (OIE) here: https://oie.duke.edu/report-an-incident/"

Academic Accommodations
For students who need accommodation in this course based on a disability, please reach out to the Student Disability Access Office (SDAO) as soon as possible. You can contact SDAO here: http://www.access.duke.edu/ or (919) 668-1267.

Use of Artificial Intelligence Tools
Students are authorized to use generative Artificial Intelligence (AI) tools only if permitted by the course instructor. All use of AI-generated content must be properly cited.
Academic Integrity and Plagiarism

All work submitted in your course must be your own. Contributions from anyone or anything else -- including artificial intelligence (AI) sources, must be properly quoted and cited every time they are used. Failure to do so constitutes an academic integrity violation. Instances of a student not citing AI sources correctly may be considered a violation of the Duke Community Standard and the School of Nursing Academic Integrity and Professionalism Policy.

Citing Artificial Intelligence Sources
In-text citation: (ChatGPT, 2023)
Reference list: ChatGPT. (2023, January 18). Prompt(s). [Response to user question - use text, screenshot or hyperlink to original conversation]. Retrieved from [URL of the platform where the conversation took place].

Course and Teacher Evaluations
Insert this statement for all courses for which students complete standard course and instructor evaluations (Examples of courses that are excluded include independent studies, directed scholarship, and DNP Projects

During the last few weeks of this course, you will be sent information about completing an evaluation of the course itself and the faculty who taught it. It is the student's professional responsibility to complete those evaluations and give thoughtful, constructive feedback about what worked well and what could be changed to strengthen this course. Please discuss any questions about these evaluations with the course faculty or your advisor. Your evaluations are confidential, anonymous to faculty, and will in no way affect your grade in the course.

Course Objectives: By the end of the course, all students will be able to:

1. Select an appropriate statistical method based on the research question or hypothesis. (*Scholarship*)
   EVALUATION: Homework assignments, class discussion, final
2. Explain the major purpose, assumptions, strengths, and weaknesses of the selected statistical method. (*Scholarship*)
   EVALUATION: Homework assignments, class discussion, final
3. Demonstrate basic data management skills and conduct data analysis of the selected statistical method using statistical software. (*Information Management, Scholarship*)
   EVALUATION: Homework assignments, final
4. Interpret statistical results in the outputs from statistical software. (*Scholarship, Leadership*)
   EVALUATION: Homework assignments, final

Textbooks
Required: Gordon, R. A. (2012). Applied statistics for the social and health sciences. Routledge. ISBN-13:978-0415875363

Statistical Software
R Studio is required for this course. **Please make sure you have access to R Studio through your laptop prior to our first class/lab session.**

Evaluation Method:
Regular attendance at, and on-time arrival for, each class is expected. The only unavoidable reasons for absences, and thus automatically excused, are illness or other emergency circumstances. For all non-emergency absences such as conference attendance, student may miss classes with the permission of instructor at least a week in advance. However, students are responsible for the missed content and for arranging with classmates to obtain copies of handouts, notes, and information on assignments. In addition, students are expected to maintain adequate progress in the course despite absences.

Assignment Weights:
1. Homework assignments (50%)
2. Presentation (10%)
3. Final Exam (35%)
4. Class discussion participation (5%)

Grading Scale:

A	93 - 100
A-	90 - 92
B+	87 - 89
B	83 - 86
B−	80 - 82
C+	77 - 79
C	73 - 76
C−	70 - 72
F	69 and below

Homework Assignments: 50%
There are ten homework assignments. Homework assignments are comprised of interpreting statistical output as well as conducting statistical tests using R. You can discuss the homework with classmates, but the R codes and homework write-up needs to be your own.

1. All assignments will be posted on Canvas at least one week before the due date. The assignment will be due on Canvas on the due date by 11:55pm.
2. Assignments submitted late will not be accepted without prior arrangement with faculty.
3. With permission of faculty, missed homework assignments may be made up, but you can only earn up to **80%** of the original credits.

Presentation: 10%

Group presentation on non-parametric test.

Final Exam: 35%

The final exam will include one to two data-based research questions. You will be expected to carry out appropriate data management, select and perform suitable statistical analyses based on the questions and the variables available in the dataset. Your responses should include a clear summary, interpretation of results, and a formal written report. You may use any reference

materials you have, but you are not permitted to seek help from others. I will be available to clarify any questions about the exam content or instructions.

Class participation: 5%

You are expected to attend class regularly and engage actively in class discussions. Each week, you will be asked to apply core concepts from the course to your developing research program. Full credit will be given to students who contribute thoughtfully to weekly discussions by sharing examples from their area of study and offering constructive feedback on their peers' contributions.

Weekly Schedule

Week	Time	Topic	Assignment
1	Aug 28	Course Overview, Data Encoding	Homework 1 (Due Sept 17 10 points)
2.	Sep 4	Variables, Levels of Measurement, Descriptive Statistics	
3.	Sep 11	Inferential Statistics I: Sampling Distribution	
4.	Sep 18	Inferential Statistics II: Parameter Estimation and Confidence Interval	Homework 2 (Due Oct 1 15 points)
5	Sep 25	Inferential statistics III: Hypothesis Testing	
6.	Oct 2	Analysis of Difference in Means I: t-Tests	Homework 3 (Due Oct 22 10 points)
Fall break			
8.	Oct 16	Power and Effect Size	
9.	Oct 23	Analysis of Difference in Proportion: Chi-Square Test, Fisher Exact Test	Homework 4 (Due Nov 5 5 points)
10.	Oct 30	Analysis of Difference in Means II: One-Way ANOVA	
11.	Nov 6	Analysis of Relationship I: Correlation (Pearson and Spearman Correlation)	Homework 5 (Due **Nov 25** 10 points)
12.	Nov 13	Analysis of Relationship II: Simple Linear Regression	

13.	Nov 20	Nonparametric Tests vs. Parametric Tests	Presentation (Due Nov 20 10 points)
14.	Nov 26-Dec 10	Final Exam	35 points (Due Dec 10)

*Weekly schedule subject to change, please check N911 Canvas website for updates.