# NONPARAMETRIC DATA ANALYSIS

**(ERMA 8330)**

**Summer 2021**

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Class hours: Tuesdays 4:00PM-7:50PM Email: kks0013@auburn.edu

and Thursdays 4:00PM-7:50PM

Office hours: By Appointment Office Address: 4018 Haley Center

# COURSE DESCRIPTION:

Common non-parametric statistical tests appropriate for use with nominal and ordinal data in educational applications. These include rank-order correlation, sign tests, median tests, analysis of variance of ranks and log-linear analysis.

# COURSE OVERVIEW:

The purpose of this course is to orient students to the applied use of nonparametric statistical analysis. Students will engage with real and simulated data to practice using a variety of nonparametric statistical procedures. Some of these procedures mirror parametric tests, and provide an alternative to those tests. Other answer research questions not easily tested through parametric tests. On completing this course, students will be comfortable deciding on what test to use, applying that procedure to real-world research problems, and writing up their results in APA style.

# REQUIRED COURSE MATERIALS:

Corder, G. W., & Foreman, D. I. (2014). *Nonparametric statistics: A step-by-step approach* (2nd ed.). Hoboken, NJ: Wiley.

American Psychological Association. (2019). *Publication manual of the American Psychological Association* (7th ed.). Author.

Other course readings may be required, and will be posted on Canvas.

# COURSE ASSIGNMENTS:

1. **Projects:** Throughout the course, you will complete projects designed to expand your understanding of design and analysis concepts, and apply them to educational research problems. Directions for these projects are provided separately. Students are not encouraged to ‘work ahead’ as each project builds on concepts learned in class during the assigned week. Each project will be worth 100 points, and there will be a total of nine projects. Projects can be completed during the scheduled Lab Days.
2. **In-Class Participation:** Class participation is mandatory, particularly given the workshop-style format of the course. Students are expected to attend every session when class meets (attending Lab Days is optional). Participation is graded out of 100 points. Students missing more than one lecture period are eligible for a maximum of 50 points; while students missing more than two lecture periods are eligible for a maximum of 0 points. (The class only has six lecture days).

# GRADING STRUCTURE/REQUIREMENTS:

There are a total of 1000 points in the course, which means you can take your total points and divide by ten to determine your percentage grade in the course. The grading structure is as follows:

|  |  |
| --- | --- |
| **Assignment Type** | **Total Points Possible** |
| Projects | 900 |
| In-Class Participation | 100 |
| **TOTAL POINTS** | **1000 points** |

The course is graded as follows: A = 1000-900, B = 899.9-800, C = 799.9-700, D = 699.9-600, F < 600.

# CLASS PREPAREDNESS:

Students are expected to arrive to class on time and prepared for required coursework. This means arriving prepared for in-class activities that may require the use of the textbook, spare paper, a calculator, and copies of out-of-class assignments. A standard, inexpensive calculator is all that is needed – any calculator that includes the square root (√) function is sufficient. You may also wish to print copies of class notes that are pre-posted to Canvas to aid in understanding/note-taking.

# CLASS ATTENDANCE:

Class attendance is a key component of success in graduate-level coursework. As allowed by university policy, it is possible to earn course grade of failing due to excessive absences. Students with more than two absences (other than university-approved excused absences) will receive a grade of failing due to excessive absences, regardless of scores on course assignments. Refer to the university attendance policy for information on attendance requirements and university-approved excused absences. Note that this course will offer a hybrid/flexible model, meaning you can join in person or via Zoom. Students are highly encouraged to attend in person when possible. However, all students attending in person will be required to wear an appropriate face covering which fully covers the nose and mouth and fits snugly. That face covering must adhere to university requirements for face coverings (e.g., at least two-layer fabric mask or a mask constructed of non-woven material such as a surgical mask or KN-95 mask). In order to allow full compliance with this policy, the class will also have a policy that no food or drink can be consumed during class. However, there will be breaks during class time.

A note on class format: There are scheduled lecture days and scheduled lab days. In most years, the course would be structured where each class session is a mixture of lecture and lab. As an additional layer of COVID-19 precaution, this has been restructured. Attending class on lab days is optional. However, you can choose to attend lab days to work on projects, to talk with the course instructor further, etc. Because lab days are optional for attendance, they do not ‘count’ toward the attendance policy.

# LATE WORK POLICY:

Late work is not generally acceptable in graduate work. However, if you find that you are falling behind in your coursework, it is of the utmost importance that you immediately contact your instructor. As soon as you know there is any problem, immediately contact the course instructor. This is the best way to stay caught up with the course. Given the compressed nature of summer courses, this is especially crucial.

If you find that you need to submit late work **it is required that you contact the instructor before submitting any late work.** Any late work submitted without first contacting the instructor to discuss the work and form a plan for getting caught up to date with coursework will not be accepted. This is to make sure that you receive all information you need about which assignments will take priority in getting caught up, and what, if any, credit can be given to late work before beginning. Communication is the key in getting caught up if you find yourself behind on work, so call, email, or stop by, whatever you need to do to get in contact!

If any late work is accepted following communication with the instructor and establishment of a written plan, it will be worth a reduced level of course credit, typically 50%. The exact percentage will be established in the written plan you make with the instructor. One key exception is that, generally, students can receive an extension of 24-48 hours once in the semester without any reduction in course credit..

# TENTATIVE COURSE CALENDAR:

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| --- | --- | --- | --- |
| **Class** | **Readings** | **Content** | **Project** |
| 1  05/20/21 | Chapter 1, Chapter 2 | Introduction to nonparametric analysis; The Kolmogorv-Smirnov test | Project 1 |
| 2  05/25/21 | Chapter 3, 4 | The Wilcoxon signed rank test, The Mann Whitney *U* test |  |
| 3  05/27/21 |  | Lab Day | Project 2 & 3 |
| 4  06/01/21 | Chapter 5, 6 | The Friedman test, The Kruskal-Wallace *H* test |  |
| 5  06/03/21 |  | Lab Day | Project 4 & 5 |
| 6  06/08/21 | Chapter 7 | Pearson product-moment correlation; Spearman Rank Correlation; Point-Biserial Correlation; Phi coefficient |  |
| 7  06/10/21 |  | Lab Day | Project 6 |
| 8  06/15/21 | Chapter 8, 9 | Chi-square tests for goodness-of-fit and independence; The runs test |  |
| 9  06/17/21 |  | Lab Day (also available time to workshop Project 9) | Project 7 & 8 |
| 10  06/22/21 |  | Presentations of project 9 | Project 9 |

*Note.* All readings other than the textbook can be found on Canvas listed under the number of the week. Other outside readings may be added to this schedule as needed. Projects are intended to be completed in class, so are assigned on the dates listed, and due before the next class meeting.

# POSSIBLE CHANGES TO THE SYLLABUS:

This syllabus is your contract for production in the course. If changes are made to it they will be posted on Canvas and announced in class or by email. No changes increasing requirements will be made.

# ADDITIONAL INFORMATION AND POLICIES:

Graduate study requires a high level of independence, accountability, and conscientiousness in order to achieve success both in their program and in careers that require graduate study. As such, a number of guidelines are helpful that make clear the expectations of graduate students.

1. The Student Policy eHandbook applies to this course. Please review the eHandbook at http://www.auburn.edu/student\_info/student\_policies/
2. Many people may go by a name in daily life that is different from their legal name. In this classroom, we will refer to people by the names that they go by. Pronouns are a way to affirm someone’s identity. They are simply a public way in which people are referred to in place of their name (e.g., “he” or “she” or “they” or “ze” or something else). In this classroom, you are invited to share what pronouns you go by, and we will refer to people using the pronouns that they share.
3. Grades associated with incomplete course work or withdrawal from class will be assigned in strict conformity to University policy (see Auburn University Bulletin). If you wish to drop this course you may do so by the 10th class day with no grade assignment. From the 10th class day to mid-semester a W (withdrawn-passing) grade will be recorded in your transcripts. After this period withdrawal from the course will only be granted under unusual circumstances and must be approved by the Dean of the College of Education.
4. The Department of EFLT recognizes university policy regarding academic misconduct. Violations include, but are not limited to: plagiarism, unauthorized assistance during examinations, submitting another’s work product as your own, using another’s words as your own without appropriate citation, sharing unauthorized materials with another that contain questions or answers to examinations, altering or attempting to alter assigned grades. In accordance with University policy regarding academic misconduct, students may be subject to several sanctions upon violations of the Student Academic Honesty Code. See the Tiger Cub publication for the current year for specifics regarding academic misconduct as well as student’s rights and responsibilities associated with the Code.
5. Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. If you have not established accommodations through the Office of Accessibility, but need accommodations, make an appointment with the Office of Accessibility, 1228 Haley Center, 844-2096 (V/TT).
6. Students are expected to be in class for the entire class period every class meeting. If there is an unavoidable conflict (such as a professional conference that coincides with a class meeting) this should be communicated with the instructor as early as possible. In the event that you have a legitimate emergency that prevents you from attending class, you should: 1) contact the instructor by email immediately upon learning you will be unable to attend class (this should be before the class meets), 2) take appropriate steps to catch up with in-class learning opportunities, 3) ensure that all of your work that was due during that class meeting makes it to the instructor before the class meeting ends (email it, have a friend drop it by the office, etc.). Failure to be in class during an exam without agreement from and prior arrangements with the course instructor will result in a grade of zero on the exam.
7. Students are responsible for checking their student email account regularly for course announcements and course-related communications.
8. This course uses Canvas as a tool to manage course readings and other materials not included in the required texts for this course and for online course discussions. Students are expected to have a working knowledge of Canvas in order to access materials and participate in online course discussion.
9. My lectures and course materials, including power point presentations, tests, outlines, and similar materials, are protected by copyright. I am the exclusive owner of copyright to those materials I create. You may take notes and make copies of course materials for your own use. You may not and may not allow others to reproduce or distribute lecture notes and course materials *publicly* (whether or not a fee is charged) without my express written consent. Similarly, you own copyright to your original papers and exam essays. If I am interested in posting your answers or papers on the course web site, I will ask for your written permission.
10. Except in the case of an approved disability accommodation (see above on this list), students **are not permitted** to audio or video record any portion of class. This policy, prohibiting the recording of class sessions, helps preserve an inclusive, friendly, and safe learning environment.