**Syllabus**

**Course Number:** ERMA 8330

**Course Title:** Nonparametric Statistics

**Semester:** Summer, 2023

**Credit Hours:** 3 credit hours

**Prerequisites:** ERMA 7300

**Meeting Time:** Tuesdays & Thursdays 4:00~8:00 PM

**Instructor:** Chih-Hsuan Wang

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**Office Hours:**  Email to make an appointment.

**Date Syllabus Prepared:** May 2023

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**Texts:**

There is no required textbook.

**Recommended:**

Corder, G. W., & Goreman, D. I. (2014). *Nonparametric Statistics: A Step-by-Step Approach (2nd ed.)*. Wiley, Hoboken, New Jersey. (ISBN: 978-1118840313)

Siegel, S. & Castellan, N. J. Jr. (1988). *Nonparametric Statistics for the Behavioral Sciences* *(2nd ed.)*. McGraw-Hill, Inc., New York. (ISBN: 978-0070573574)

Shannon, D. M. & Davenport M. A. (2000). *Using SPSS to Solve Statistical Problems: A Self-Instructional Guide*. Merrill Prentice Hall, Upper Saddle River, New Jersey. (ISBN: 978-0132675765)

American Psychology Association (2019)*. Publication Manual of the American Psychological Association (7th ed.)*. Washington D.C., American Psychological Association. (ISBN: 978-1433832161)

**IMPORTANT:**

1. All course materials (syllabus, PPTs, lab assignments, and data files, rubrics…etc.) will be available on Canvas. Check the Canvas site weekly for announcements, assignments, and information before each class. I am not going to provide hard copies.
2. Our class will be delivered in both F2F and Online formats. You can access our class Zoom room through the Canvas class page or just join the Zoom room type in Zoom ID # (TBA).
3. If you enroll in the F2F class, you are expected to be either in the class or Zoom in synchronously. If you enroll in the Distance class, you are encouraged to join us synchronously, but you can also complete your coursework asynchronously.
4. I will not accept the work completed by hand unless it is the only way to do it.

**Required Computer Software and Skills:**

1. Access to high-speed internet through smart mobile devices or computers.
2. SPSS version 27/28/29 (at least **Grad Standard Pack, NOT Base Pack**).
   1. You can purchase/rent the SPSS Standard Grad Pack from these distributors listed on the IBM website:

<https://www.ibm.com/us-en/marketplace/spss-statistics-gradpack/details>

* 1. There are several vendors on the SPSS website. Their prices are varied. You can try to find the best deal among those vendors.
  2. Or you can access the SPSS virtually through the Internet. You need to use VPN to be able to access the virtual lab. Remember that when you are in the virtual lab, you are NOT using your own computer. Do NOT save anything on the computer or desktop. Instead, you need to email the files or save them on thumb drives.

1. You can use other statistical software/packages, such as SAS, R, STATA, or Python, to complete your work. However, I only introduce SPSS in our class.
2. Microsoft Office Word.
3. PDF file creator (e.g. Adobe Acrobat).
4. Online Learning Platform (Canvas) basic skills: open, download, and upload documents, review documents and video clips online, and **review instructor feedback on the Canvas. (More student resources for Canvas can be found here:** <http://wp.auburn.edu/biggio/canvas/student-help/> )
5. Zoom application. You can install it on your computers, tablets, or smartphones. This is for participating in virtual office hours.

**Other Prerequisite Skills:**

Students taking this class are expected to be able to perform the following basic skills **at the beginning** of the class:

1. **Computer basic skills**: open, save, copy-paste, use track changes, make tables, and create Word and PDF documents.
2. **Online learning platform basic skills**: open, download, and upload documents, review documents and video clips online, and **review instructor feedback on Canvas. (More student resources for Canvas can be found here:** <http://wp.auburn.edu/biggio/canvas/student-help/> )

**Course Description:**

This course is designed to provide students with an understanding of nonparametric statistical methods pertaining to design and analysis in educational research. Parametric statistics will be reviewed, and parallel nonparametric statistics will be compared to the characteristics and uses of the parametric statistics. This course emphasizes conceptual understanding and application as well as calculations of nonparametric statistics.

**Course Objectives:**

Students will:

* Gain an understanding of nonparametric statistical procedures.
* Apply knowledge of nonparametric statistics by analyzing research problems and making decisions about the appropriate use of nonparametric procedures.
* Apply knowledge of nonparametric statistics using SPSS and/or hand calculations to determine significance.
* Apply knowledge of inferential statistics by interpreting the results of statistical analyses.
* Interpret the results of the analyses in terms of the research hypothesis.

**Course Requirements:**

* Attend all class sessions and participate in class activities.
* Complete all lab assignments.
* Review and summarize one research article and provide feedback to 3 reviewed articles.

**Grading and Evaluation Procedures:**

Review one article 50 points

Feedback on three reviewed articles 30 points

Labs 120 points

Total possible points 200 points

* Students missing three or more class meetings will have their final grade reduced by one letter grade.
* Any assignment presented or turned in late will be penalized 5% for each day past the assignment deadline. Assignments more than 2 weeks overdue will not be accepted.
* You can check your grade for each assignment you submitted in the Canvas. However, I keep the official grades in an Excel file and will calculate your final grade using Excel or SPSS.

**Grading Scale:**

|  |  |
| --- | --- |
| **Grade** | **Percentage** |
| **A** | ***180 points and above, and excellent attendance and participation*** |
| **B** | ***160~179 points and at least good attendance and participation*** |
| **C** | **140~159 points** |
| **D** | **120~139 points** |
| **F** | **<120 points** |

* Class Attendance

In order to explore topics effectively, attendance and class participation are essential. You are expected to attend class and participate in the group discussion. Students missing three or more class meetings will have their final grade reduced by one letter grade.

* Review one article (50 points)

1. You are expected to find an academic article on one statistical topic discussed this semester. You will sign up for a statistical topic at the beginning of the semester and find an article using this statistical strategy to analyze data.
2. You are expected to post the reference of the article on the Discussion Board (APA format).
3. You need to write and post a summary of the article. Here is the content required for your summary:
   1. What is the purpose of the study?
   2. Summary of the literature review.
   3. Identify independent & dependent variables in the study.
   4. Describe the methods. Who are the participants? Discuss the sampling procedures and the sampling method.
   5. What measures/instruments were used? Find & discuss evidence concerning the reliability and validity of instruments/investigation.
   6. Identify the type/design of the study. Be as specific as you can.
   7. How was data analyzed? Identify a statistical technique used. Summarize the findings of the study.
   8. What conclusions do the authors draw? What are the implications of the research?
4. Everything needs to be posted on the Discussion Board. You will be responsible for answering any questions or responding to the feedback provided by your colleagues.

* Provide feedback to three reviewed articles (10 points each \* 3 = 30 points)

Before the end of the semester, you will need to go to the Discussion Board and review at least three (3) posts and provide your feedback under that post.

* Labs (20 points each \* 6 = 120 points)

Labs are designed to introduce you to the use of SPSS to complete analyses taught in class. Due to time restraints, it is NOT intended to provide you with enough practice to memorize procedures. You should have reference books to help you complete analyses via SPSS when completing assignments on your own.

1. Lab #1: Binomial & Chi-Square Goodness-of-fit Tests
2. Lab #2: Fisher Exact & Chi-Square Independence Tests
3. Lab #3: McNemar & Kolmogorov-Smirnov Tests
4. Lab #4: Mann-Whitney U & Kruskal-Wallis H-Tests
5. Lab #5: Wilcoxon Signed Ranks & Friedman Tests
6. Lab #6: Association/Correlation

**Class Policy Statements**

* ***Email and Communication***

1. All communication through emails needs to be via the Auburn Tiger Email system. In other words, you need to use your university email address to send me emails, and I will do the same. Emails will be responded to **within 48 hours** **excludes weekends and holidays.**
2. All PPTs and announcements will be posted in the Canvas at the beginning of each week. You are responsible to check the Canvas every week.
3. All assignments need to be uploaded in the Canvas. I will grade your assignments in the Canvas. **You can check your grade and my feedback for each assignment in the Canvas as well.** However, I keep your official grades in my Excel file.
4. If you need individual help, you can reach me during office hours, email me, or make an appointment (request a Zoom meeting).

* ***Class Attendance***

Points are not attached to attendance directly. However, in order to explore topics effectively, attendance and class participation are essential. Excellent class attendance is required to earn an A and to earn lab or other PPT activity points. If you need to be absent for school or work-related requirements, illness, or an emergency, you are allowed to make up points for no more than two classes. Students are responsible for initiating arrangements for missed work.

* ***Assignment Policy***

1. Assignments need to be submitted/uploaded on Canvas in Word or PDF format.
2. All work submitted for the course must be typed.
3. Due to the potential incompatibility of word processing programs and formats, and the potential for the transmission of viruses, absolutely no work for the course will be accepted as an E-mail and/or as an E-mail attachment, or on a disk, etc. All graded work must be uploaded onto Canvas.

* ***Late Assignments Policy***

1. Assignments turned in late will receive a 5% reduction in earned points per day. The only exception will be in the case of an emergency.
2. Assignments more than 2 weeks overdue will not be accepted.
3. Except for work requiring calculations, all work must be typed or it will **not** be graded. A late penalty will be applied to work completed in writing and then turned in late in typed format for a grade.

***Incompletes and Withdrawals***

Grades associated with incomplete coursework or withdrawal from class will be assigned in strict conformity with 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-quarter 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.

Note that the incomplete grade (IN) policy is in effect. The new policy requires that students complete a form requesting that an IN grade be assigned. If this form is not completed and given to the instructor of the class, a grade will be assigned with a score of zero (0) for work that has not been completed and turned in by the time the instructor reports grades. To be eligible for a grade of IN, the student must have completed and passed more than half of all class assignments/exams for the semester.

* ***Academic Misconduct***

1. **Academic Honesty**

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, and 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.

1. **Plagiarism**

For more information, see:

<http://www.collegeboard.com/student/plan/college-success/10314.html>

<http://owl.english.purdue.edu/owl/resource/589/01/>

<http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml>

* ***Disability Accommodations***

Students who need special accommodations in class, as provided for by the American Disabilities Act, should arrange a confidential meeting with the instructor 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. You must bring a copy of your Accommodation Memo and an Instructor Verification Form to the meeting. If you do not have these forms but need accommodations, make an appointment with the Program for Students with Disabilities, 1228 Haley Center, 844 2096 (V/TT).

**Tentative Course Content and Schedule**

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| --- | --- | --- |
| **Date** | **Topic(s)** | **Assignment Due** |
| 5/18 | Introduction  One sample Categorical Data   * Binomial Test * Chi-square Goodness-of-Fit Test | Lab #1  Due on Sunday, 5/21 |
| 5/23 | 2 Independent Samples Categorical Data   * Fisher Exact Test * Chi-Square Independence Test |  |
| 5/25 | No Class | Lab #2  Due on Sunday, 5/28 |
| 5/30 | 2 Related Samples Categorical Data   * McNemar Test |  |
| 6/01 | One sample Ordinal Data   * Kolmogorov-Smirnov Test | Lab #3  Due on Sunday, 6/04 |
| 6/06 | 2 Independent Samples Ordinal Data   * Mann-Whitney U test * Kolmogorov-Smirnov Two-Sample Test |  |
| 6/08 | 2+ Independent Samples Ordinal Data   * Kruskal-Wallis H-Test | Lab #4  Due on Sunday, 6/11 |
| 6/13 | 2 Related Samples   * Wilcoxon Signed Ranks Test |  |
| 6/15 | 2+ Related Samples Ordinal Data   * Friedman Test | Lab #5  Due on Sunday, 6/18 |
| 6/20 | Association/Correlation   * Phi Coefficient * Point Biserial * Spearman * Kendall | Lab #6  Dues on Sunday, 6/25 |

NOTE: This is a tentative syllabus. Any changes will be announced in class. Students are responsible for being aware of the changes made.