Course Syllabus: **Applied Research Statistics in Exercise Physiology**

EXPH 5013-201

Spring 2025

Department of Athletic Training & Exercise Physiology

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Office Hours: MW: 10 -11am; TTH 9-11am, other times by appointment
Day and Time: TTH: 12:30-1:50pm
Location: CO 223

Important Dates:

First Day of Class	Tuesday, January 21
Last day to Add/Drop	Friday, January 24
Last day for "W"	Wednesday, April 30 (4pm)
Exam I	Tuesday, March 4 (in class)
Research Project	Tuesday/Thursday, April 29/May 1
Final Exam	Thursday, May 15 10:30am-12:30pm

Textbook: *There is no textbook for this course. Information will be presented using power points and media and other materials from multiple sources and uploaded to D2L*

Course objectives:

- Introduction statistics used in research
- Be able to understanding statistical analyses
- Be able to perform statistical analyses
- Be able to analyze data and present these data to a group/class

Student Handbook

Refer to: Student Handbook-2018-19

Grading

Course Grade - Grades will be based on your performance in the following areas:
Table 1: Percentages allocated to each assignment.

Assignments	**%**
Exams (Midterm and Final)	40
Daily problems	20
Research Statistics Project	40
Total	100

Table 2: Total percentages for final grade.

Grade	**%**
A	90-100
B	80-89.99
C	70-79.99
D	60-69.99
F	< 60

Attendance and Class Requirements

CLASS REQUIREMENTS: Each day the class will be exposed to new concepts pertaining to statistics. Applications to these concepts will be given. The class will then work on problems associated with the concepts and their application. Following this, the class as a group will go over the problems. Because we will be "working through" the concepts and applications each day, it is imperative that daily attendance be maintained. Furthermore, daily points will be established from this work. In addition, from these concepts and work performed each day, periodic homework problems will be given. These problems will then be addressed at the following class for problem solving and statistical interpretation.

TESTS: Please note that the exams listed have both a practicum and written portion. The practicum portion will be statistical problems established on computer statistical programs that the student will have to run and then interpret. The written portion will be in the format of traditional written tests.

RESEARCH STATISTICS PROJECT: Early in the semester a topic in the area of Exercise Science will be assigned. Students will be required to “collect” data – enough to perform statistical analyses. These data can be collected over a few days or a few weeks. From this, each student will be required to determine the appropriate statistical design, perform the statistics and interpret the findings. This is similar to the “Results” section of a research project. The interpretation aspect will be similar to a “Discussion” section of a paper. This will involve correct analysis of the findings and correct

interpretation with references. A minimum of 10 references will be required for this section. Each student will present their findings to class in a formal power point presentation. A hard copy document will be turned in with the following format:

All work will be in 12 pt Font
Title Page: Title of the Project, Name of the Student, Identification of the Class
Statement of the Problem
Raw Data
Statistical Procedures Performed
Results of Statistical Procedures: Tables, Figures
Discussion with References (APA Format)
References (minimum 10)

TurnItIn and AI detection will be used in D2L to detect any plagiarism or AI generated writing.

*The final exam is set at the beginning of the semester and this time is assessable to all students. This set time for the final exam is not negotiable. There will be no flexibility in altering the day or time for taking the final exam.

Late Work

Late assignments will not be accepted.

Make Up Work/Tests

No make-up exams/assignments will be given for any personal reasons, except under medical/ religious/family emergency situations/ authorized participation in official school functions.

Classroom Policies: It is assumed that everyone enrolled in this course is here to pursue further knowledge. The following list provides what will be expected by the instructor and should also be expected by the students:

1. Attendance in online class is expected. Please review the class on D2L each day for uploaded readings, recorded lectures, or other links that will help in your studies. I also welcome any Chats/Discussion through D2L if there are any questions.
2. If you have a question please email me at michael.olson@msutexas.edu for quicker response. Questions can also be posted in the Chat or Discussion board of D2L.
3. Neither academic dishonesty nor plagiarism will be tolerated and as such, disciplinary action will be issued in accordance with university guidelines.

Services for Students With Disabilities

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Midwestern State University endeavors to make reasonable accommodations to ensure equal opportunity for qualified persons with disabilities to participate in all educational, social, and recreational programs and activities. After notification of acceptance, students requiring accommodations should make application for such assistance through Disability Support Services, located in the Clark Student Center, Room 168, (940) 397-4140. Current documentation of a disability will be required in order to provide appropriate services, and each request will be individually reviewed. For more details, please go to http://www.mwsu.edu/student-life/disability.

College Policies

Academic Dishonesty:

The MSU Student Handbook covers Academic Honesty under University Policies (https://msutexas.edu/student-life/_assets/files/handbook.pdf) and Procedures. Academic dishonesty is defined as cheating, collusion, and plagiarism.

• Cheating is (1) the use of any unauthorized assistance, (2) dependence upon the aid
of sources beyond those authorized by the Instructor, or (3) acquisition, without permission, of tests or other academic material.

• Plagiarism is the use of another person's published or unpublished work without full
and clear acknowledgment.

• Collusion is collaboration with another person in preparing work offered for credit if
the faculty member in charge does not authorize that collaboration.

The use of artificial intelligence (AI), such as ChatGTP is prohibited in this course. Students are required to provide original thoughts and ideas related to the topic area when prompted, such as for written assignments and essay questions on exams.

College Policies

Campus Carry Rules/Policies

Refer to: Campus Carry Rules and Policies

Smoking/Tobacco Policy

College policy strictly prohibits the use of tobacco products in any building owned or operated by WATC. Adult students may smoke only in the outside designated-smoking areas at each location.

Alcohol and Drug Policy

To comply with the Drug Free Schools and Communities Act of 1989 and subsequent amendments, students and employees of Midwestern State are informed that strictly enforced policies are in place which prohibits the unlawful possession, use or distribution of any illicit drugs, including alcohol, on university property or as part of any university-sponsored activity. Students and employees are also subject to all applicable legal sanctions under local, state and federal law for any offenses involving illicit drugs on University property or at University-sponsored activities.

Pregnant and Parenting Students
To support the academic success of pregnant and parenting students and students with pregnancy related conditions, the University offers reasonable modifications based on the student's particular needs. Any student who is pregnant or parenting a child up to age 18 or has conditions related to pregnancy, may contact MSU's designated Pregnancy and Parenting Liaison to discuss support available through the University. The Liaison can be reached by emailing ruby.garrett@msutexas.edu or calling 940-397-4500. Should a student communicate with me that they are pregnant or have a pregnancy related condition or may need additional resources related to pregnancy or parenting, I will communicate that student's information to the Title IX Coordinator, who will work with the student and others, as needed, to ensure equal access to the University's education program or activity.

A pregnant student, a parenting student, or a student with pregnancy related conditions may be provided with supportive measures, based on the student's individualized needs, analogous to those provided to a student with a temporary medical conduction, and provided such supportive measures do not fundamentally alter the nature of an education program or activity. Such supportive measures may include, but are not limited to:
For pregnant students:
(1) Providing breaks during class to express breast milk, breastfeed, or attend to health needs associated with pregnancy or related conditions, including eating, drinking, or using the restroom;

(2) Excusing intermittent absences to attend medical appointments;

(3) Providing access to online or homebound education, including the providing of access to instructional materials and video recordings of lectures (to the extent such materials, recordings are made available to any student with an excused absence);

(4) Facilitating changes in schedule or course sequence, including extensions of time for coursework and rescheduling of tests and examinations and/or providing opportunity to make up missed assignments/assessments (such time extensions shall be applied in the same manner as the University grants and provides ADA/504 accommodations for additional time);

(5) Allowing a student to sit or stand, or carry or keep water nearby;

(6) Offering counseling;

(7) Facilitating changes in physical space or supplies (for example, access to a larger desk or a footrest);

(8) Allowing the student to maintain a safe distance from substances, areas, and activities known to be hazardous to pregnant individuals or unborn children;

(9) Providing elevator access;

(10) Facilitating a voluntary leave of absence from the University if the student is in good academic standing at the time the student takes a leave of absence, and facilitating a return to the student's degree or certificate program without being required to reapply for admission if the student remains in good academic standing; or

(11) Making other necessary changes to policies, practices, or procedures.

For Parenting Students:

(1) Facilitating priority registration to the extent the University provides early registration for any other group of students; or

(2) Facilitating a voluntary leave of absence from the University if the student is in good academic standing at the time the student takes a leave of absence, and facilitating a return to the student's degree or certificate program without being required to reapply for admission.

Obligation to Report Sex Discrimination under State and Federal Law
Midwestern State University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from sex discrimination of any kind. State and federal law require University employees to report sex discrimination and sexual misconduct to the University’s Office of Title IX. As a faculty member, I am required to report to the Title IX Coordinator any allegations, personally observed behavior, or other direct or indirect knowledge of conduct that reasonably may constitute sex discrimination or sexual misconduct, which includes sexual assault, sexual harassment, dating violence, or stalking, involving a student or employee. After a report is made, the office of Title IX will reach out to the affected student or employee in an effort to connect such person(s) with resources and options in addressing the allegations made in the report. You are also encouraged to report any incidents to the office of Title IX. You may do so by contacting:

Laura Hetrick
Title IX Coordinator
Sunwatcher Village Clubhouse
940-397-4213
laura.hetrick@msutexas.edu

You may also file an online report 24/7 at
https://cm.maxient.com/reportingform.php?MSUTexas&layout_id=6
Should you wish to visit with someone about your experience in confidence, you may contact the MSU Counseling Center at 940-397-4618. For more information on the University's policy on Title IX or sexual misconduct, please visit
https://msutexas.edu/titleix/

Tentative Course Schedule:

Week	Content
1-2	Measurement, statistics and research: process, variables, design, Inference, Statistical inference (one sample), hypothesis testing, null & alternative hypothesis, sample size, Student Learning Outcomes • Data Entry into Excel • Working with charts
3-4	Descriptive statistics & measures of central tendency (mean, median, mode); level of significance, type I and type II errors, power, confidence interval, Normal distribution, standard scores, z-scores and percentile ranks, central limit theorem, skewness, kurtosis, standard deviation, standard error: Percentiles, frequency distribution, class intervals, relative & cumulative distributions, graphs, histogram, shapes of distributions. Student Learning Outcomes • Identification of histograms and interpretation of frequency distributions • Critical thinking pertaining to normal and skewed distributions • Conceptual understanding of standardization of scores • Measures of central tendency (mean, median, mode) • Use of statistical spreadsheets to establish group mean, median and mode • Introductory understanding of standard deviation, standard error
5	Organizing and Displaying Data. Beginning work in Statistical spreadsheets. Student Learning Outcomes Introduction, familiarization and work in statistical spreadsheets: • Excel • SPSS
6	Measures of variability, quartile range, measure of dispersion, coefficient of variation;

Student Learning Outcomes

- Percentiles and quartiles
- Measures of variability
- Box Plots

7-8 Correlation, independent & dependent variable, correlation coefficient, Pearson Product-Moment, coefficient of determination, interpreting correlation, linear & nonlinear

Student Learning Outcomes

- Conceptual understanding of variable association
- Establishing a correlation matrix and interpretation
- Critical thinking pertaining to correlation coefficient and strength of relationships

9-10 Regression analyses, line of best fit, standard error of estimate, multiple regression, curvilinear regression

Student Learning Outcomes

- Producing graphic representation of independent variable regression to dependent variable
- Cognitive understanding of regression line and slope
- Conceptual understanding of advanced regression programs

11-12 Dependent/Independent sample t-Test (Student t-Test), degrees of freedom, control groups, one sample t & z tests, independent & dependent t-tests

Student Learning Outcomes

- Understanding between group variance
- Utilizing computer programs to run statistics for variance within and between groups
- Cognitive understanding and interpretation of variance between groups

13-14 Analysis of Variance (ANOVA), linear model equation, sum of squares (total, between and within), degrees of freedom, mean square, F ratio, homogeneity of variance, multiple comparison (Tukey, Scheff'e)

Student Learning Outcomes

- Understanding of variance between more than 2 groups
- Ability to input data, run statistical programs and interpret findings from ANOVA

15 ANOVA-repeated measures, RMANOVA, Post Hoc tests

Student Learning Outcomes

- Conceptual understanding of advanced statistical models associated with variance
- Ability to run advanced statistical program, interpret findings and perform Post Hoc testing and analysis between several groups