Course Syllabus: **APPLIED RESEARCH STATISTICS IN EXERCISE PHYSIOLOGY**

College of Health Sciences and Human Services
EXPH 5013
Spring 2023

Contact Information

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Course Description

Methods of acquisition, analysis and interpretation of data most often encountered in sport and exercise science will be included. Emphasis will be placed on descriptive methods, statistical methods, experimental design and computer applications

Textbook & Instructional Materials

No text. Readings and lectures presented by the instructor.
*__Bring your laptops to class each meeting. The class will consist of both traditional lectures and data entry/analysis with each meeting.__

Study Hours and Tutoring Assistance

NA

Student Handbook

Refer to: Student Handbook 2017-18

Academic Misconduct Policy & Procedures

Academic Dishonesty: Cheating, collusion, and **plagiarism (the act of using source material of other persons, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work not the individual's to whom credit is given)**. Additional guidelines on procedures in these matters may be found in the Office of Student Conduct.

Grading

Daily (meeting) Problem Solving	**20%**
Research Statistics Project	**25%**
Mid-Term Exam (written & practicum)	**25%**
Final Exam (written & practicum: comprehensive)	**30%**
Total	**100%**

Table 2: Total points for final grade.

90%-100%	A	Excellence
80%-89%	B	Above Average
70%-79%	C	Average
60%-69%	D	Below Average
50%-59%	F	Failure

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 meeting 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. Raw data will be given to the individual student. 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 (EVERYTHING…)
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)

***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.**

Desire to Learn (D2L)

Use of the MSU D2L program is a part of this course. Each student is expected to be familiar with this program as it provides a primary source of communication regarding assignments and general course information. You can log into D2L through the MSU Homepage. If you experience difficulties, please contact the technicians listed for the program or contact your instructor.

Extra Credit

No Extra Credit

Important Course Sequencing

LECTURE	CONCEPTS
Lecture 1	Measurement, statistics and research: process, variables, design, Inference, Statistical inference (one sample), hypothesis testing, null & alternative hypothesis, sample size, level of significance, type I and type II errors, power, confidence interval **Student Learning Outcomes** • Data Entry into Excel • Working with charts
Lecture 2	Organizing and Displaying Data. Beginning work in Statistical spreadsheets. **Student Learning Outcomes** Introduction, familiarization and work in statistical spreadsheets: • Excel • SPSS
Lecture 3 & 4	Descriptive statistics & measures of central tendency (mean, median, mode); 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
Lecture 5	Measures of variability, quartile range, measure of dispersion, coefficient of variation; Student Learning Outcomes • Percentiles and quartiles • Measures of variability • Box Plots
Lecture 6	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

Lecture 7 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

Lecture 8 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

Lecture 9 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

Lecture 10 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

Instructor Class Policies

Cell/smart-phone use is not allowed or tolerated during class periods. Individuals talking, texting or using the aforementioned electronic devices during class will be asked to leave. It will then be the responsibility of the student to obtain any information they may have missed because of their dismissal from class.

Change of Schedule

A student dropping a course (but not withdrawing from the University) within the first 12 class days of a regular semester or the first four class days of a summer semester is eligible for a100% refund of applicable tuition and fees. Dates are published in the Schedule of Classes each semester.

Refund and Repayment Policy

A student who withdraws or is administratively withdrawn from Midwestern State University (MSU) may be eligible to receive a refund for all or a portion of the tuition, fees and room/board charges that were paid to MSU for the semester. HOWEVER, if the student received financial aid (federal/state/institutional grants, loans and/or scholarships), all or a portion of the refund may

be returned to the financial aid programs. As described below, two formulas (federal and state) exists in determining the amount of the refund. (Examples of each refund calculation will be made available upon request).

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

Campus Carry Rules/Policies*
Refer to: Campus Carry Rules and Policies
***Please note that NO GUNS are allowed in Ligon Colosseum**

Smoking/Tobacco Policy
College policy strictly prohibits the use of tobacco products on campus…the WHOLE CAMPUS PROPERTY (including Sikes Lake). Also, tobacco products also means dip. NOT ALLOWED!

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.

Grade Appeal Process

Update as needed. Students who wish to appeal a grade should consult the Midwestern State University Undergraduate Catalog

Notice
Changes in the course syllabus, procedure, assignments, and schedule may be made at the discretion of the instructor.