COURSE NUMBER: KNES 5013  
MEETING TIMES: Monday, 6:00pm to 8:50pm  
CLASSROOM: CO 223  
INSTRUCTOR: Dr. Frank B. Wyatt  
OFFICE: Ligon Hall 209  
PHONE: 940.397.6229  
EMAIL: frank.wyatt@mwsu.edu


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

<table>
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<tr>
<th>LECTURE</th>
<th>CONCEPTS</th>
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| Lecture 1 | Measurement, statistics and research: process, variables, design, Inference, Statistical inference (one sample), hypothesis testing, null & alternative hypothesis, sample size, level of significance, one tailed & two tailed test, type I and type II errors, power, confidence interval (Chap. 1)  
Student Learning Outcomes  
- Data Entry into Excel  
- Working with charts  
- Data import to other statistic packages  
- Identify above concepts in research article (1) |
| Lecture 2 | Organizing and Displaying Data. Beginning work in Statistical spreadsheets.  
Student Learning Outcomes  
Introduction, familiarization and work in statistical spreadsheets:  
- Excel  
- Statistica |
| Lecture 3 | Percentiles (Chap.2) Frequency distribution, class intervals, relative & cumulative distributions, graphs, histogram, shapes of distributions. Normal distribution, standard scores, z-scores and percentile ranks, estimators, central limit theorem (Chap. 6)  
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  
- Identify above concepts in research article (2) |
| Lecture 4 | Measures of central tendency (mean, median, mode)(Chap. 4)  
- Percentiles and quartiles  
- Measures of variability  
- Box Plots |
Student Learning Outcomes
- Use of statistical spreadsheets to establish group mean, median and mode
- Identification of percentile ranks and quartiles through graphic representation of data
- Establishment of appropriate box plots and interpretation
- Introductory understanding of standard deviation, standard error

Lecture 5
Measures of variability, range, standard deviation, (Chap5)

Student Learning Outcomes
- Utilizing spreadsheets establishing standard deviation & standard error of the mean and range of group scores
- Interpreting measures of variability within groups
- Identify concepts in Lecture 4 and 5 in research article (3)

Lecture 6
Correlation, independent & dependent variable, correlation coefficient, Pearson Product-Moment, coefficient of determination, interpreting correlation, linear & nonlinear (Chap. 7)

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, logarithmic regression (Chap. 7)

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
- Identify concepts in Lecture 6 and 7 in research article (4)

Lecture 8
One & two sample t-Test (Student t-Test), degrees of freedom, control groups, one sample t & z tests, independent & dependent t-tests (Chap. 8)

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, Scheffe)(Chap. 9)

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, MANOVA, Post Hoc tests (Chap. 10)

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
Lecture 11

Analysis of Non Parametric Data (Chap. 13)

**Student Learning Outcomes**

- Introductory and conceptual understanding of non-parametric statistical procedures

**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 each 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 chosen and interpret the findings. Each student will present their findings to class.

**GRADING:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Daily Problem Solving</td>
<td>30%</td>
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<tr>
<td>Research Statistics Project</td>
<td>30%</td>
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<tr>
<td>Mid-Term Exam (written &amp; practicum)</td>
<td>15%</td>
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<tr>
<td>Final Exam (written &amp; practicum: comprehensive)</td>
<td>25%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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A=90-100*; B=80-89; C=70-79; D=60-69; F<60

*NOTE: an “A” is defined as “Excellent”. This is a grade attained through excellent work for each and every meeting of the course.