



EAST TENNESSEE STATE
UNIVERSITY

Clemmer College

Department of Sport, Exercise, Recreation and Kinesiology

PEXS 7000 – Research Methods & Statistics in Sport Science

Course Description: PEXS 7000 (3 Credits) – An in-depth study of the principles and methods of experimental design and data analysis as related to sport. The class includes discussions of experimental design dealing with hypothesis generating research as well as true experimental designs. Comprehensive and detailed discussion of data analysis will include information related to validity, reliability, assessing variable relationships, and methods of determining statistical differences applicable to sport settings.

Course Objectives:

The purpose of this course is to provide the student with statistical research tools necessary for application of science to sport. The goals of the class are to enable the student to:

1. understand the importance of error, variability, and distribution in statistical analyses
2. appropriately use the statistical analyses covered in this course (see learning outcomes)
3. develop experimental designs and statistical applications appropriate for testing hypotheses
4. gain an understanding of the importance of sound hypothesis generation in sport setting

These goals will be demonstrated through some of the following:

- Lectures & readings
- Written exams
- Project (research proposal)

Learning Outcomes:

At the completion of the course, the student is expected to be able to:

1. Apply statistics to sport science research, descriptive statistics, effect size, correlation, regression, *t* Test, and ANOVA.
2. Understand and be able to choose an appropriate experimental design including cross-sectional designs and longitudinal experimental designs.
3. Critically analyze the statistical result of your own investigations as well as other investigations and make inferences relevant to sport science.
4. Understand the importance of reliability and validity in sport science.

Prerequisites: Completion of PEXS 5670 or equivalent

Textbooks:

Vincent, W.J. (2012) *Statistics in Kinesiology* (4th ed.), Champaign, IL: Human Kinetics. ISBN 0-7360-5792-7.

Research Methods in Physical Activity (7th ed.), Champaign, IL: Human Kinetics. ISBN 978-1-4504-7044-5.

(Optional- for additional reading) Tabachnick, B. and Fidell, L. (2007), *Using Multivariate Statistics* (5th ed.), Boston, MA: Pearson Education. ISBN 0-205-45938-2.

Useful website: Hopkins, W. A New View of Statistics: <http://www.sportsci.org/resource/stats/index.html>

Student Evaluation:

1. Exam 1	15%
2. Exam 2	15%
3. Exam 3	15%
4. Labs/Assignments (6 at 5% each)	30%
5. Research Proposal (first draft)	5%
6. Research Proposal (final draft)	20%

Total	100%
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Grading Scale:

A	93 – 100%
A-	90 – 92.9%
B+	87 – 89.9%
B	83 – 86.9%
B-	80 – 82.9%
C+	77 – 79.9%
C	70 – 76.9%
F	0 – 69.9%

Class Policies & Evaluations:

- Academic Integrity:** Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly through participation or assistance, are immediately responsible to the instructor of the class. In addition to other possible disciplinary sanctions which may be imposed through the regular institutional procedures as a result of academic misconduct, the instructor has the authority to assign an “F” or a “zero” for the assignments.
- Disability Access:** We will make any reasonable accommodations for limitations due to any disability including learning disabilities. Please arrange an appointment to see instructor to discuss any special needs you might have.
- COVID-19:** While I’ve made a sincere attempt to create a flexible plan for teaching during the pandemic, the reality is that I cannot predict the future. Course meetings, learning activities, and assignments may change if we need to move quickly to a different operational stage of the university’s pandemic framework. The course has been designed this semester with the hopeful intent that we can maintain our course trajectory regardless of circumstance; however,

the instructor reserves the right to alter the course syllabus/schedule/requirements to continually meet student needs during these unprecedented times.

4. **University Mask Policy:** ETSU Mask Statement: Please wear a mask or other appropriate Face Covering to class. Wearing a mask that covers your nose and mouth communicates the care and respect you have for yourself, the care and respect you have for those you live with, and the care and respect you have for other members of this classroom community. The best evidence we have, from public health professionals, is that wearing masks is one of the best ways to protect against the spread of COVID-19 and other airborne illnesses. Students with medical conditions that inhibit their ability to wear masks should register through disability services by contact Disability Services by telephone at 423-439-8346 or by email at littleme@etsu.edu to request an accommodation. The policy can be found at <https://www.etsu.edu/policies/health-safety/face-coverings.php>
5. **Exams (15% each, 45% total):** There will be THREE written exams utilizing a combination of multiple choice, fill in-blank, and true-false. Exams will cover materials from class discussion, lectures, assignments, and in-class activities.
6. **Labs/Assignments (6 labs/assignments at 5% each, 30% total):** There will be labs and other assignments associated with various topics in the course. The completion of these labs will be critical not only to your grade, but particularly to your learning. The labs are a significant portion of your grade because of the paramount importance these tasks have on your ability to conduct sport science research.
7. **Research project proposal (25% total):** Each student will develop a proposal built on the research question and methods developed previously. Each student is to submit a word document including background and research question, short literature review showing that your research question is not fully answered yet, and methods to provide an answer to your research question.

WEEK	Lectures	Readings	Dues
Week 1	Intro to Research Design Defining the problem & Lit Search	Chapters 1 & 2 <i>Thomas</i>	Literature Search Due 8/29 at 11:59 PM
Week 2	Presenting the Problem	Chapter 3 <i>Thomas</i>	
Week 3	Formulating the Method	Chapter 4 <i>Thomas</i>	
Week 4	Ethical Issues in Research	Chapter 5 <i>Thomas</i>	Test 9/16
Week 5	Measures of Central Tendency Measures of Variability	Chapter 4, 5 <i>Vincent</i>	Literature synopsis and purpose of study Due 9/26 at 11:59 PM
Week 6	The Normal Curve	Chapter 6 <i>Vincent</i>	
Week 7	Fundamentals of Statistical Inference	Chapter 7 <i>Vincent</i>	
Week 8	Correlation & Bivariate Regression	Chapter 8 <i>Vincent</i>	Correlation lab Due 10/17 at 11:59 PM
Week 9	Multiple Regression	Chapter 9 <i>Vincent</i>	Test 10/21
Week 10	The <i>t</i> Test <i>t</i> Test lab	Chapter 10 <i>Vincent</i>	<i>t</i> Test lab Due 10/31 at 11:59 PM
Week 11	Simple ANOVA ANOVA lab #1	Chapter 11 <i>Vincent</i>	Research First Draft Due 11/7 at 11:59 PM ANOVA lab #1 Due 11/7 at 11:59PM
Week 12	ANOVA with Repeated Measures ANOVA lab #2	Chapter 12 <i>Vincent</i>	ANOVA lab #2 Due 11/14 at 11:59 PM
Week 13	Factorial ANOVA	Chapter 14 <i>Vincent</i>	Test 11/18
Week 14	THANKSGIVING BREAK- NO CLASS		
Week 15	Course Summary and Research Proposals		Research Final Draft Due 12/8 at 11:59 PM