Wildlife 311/511 – Quantitative Methods for Wildlife and Fisheries Research and Management

2019 Spring – Tentative Course Syllabus

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Office Hours: Wednesdays 12-2:00pm, or by appointment
Class Meeting Times: Section 1 (Tuesdays and Thursdays 12:30PM-1:45PM TNR 352)
Section 2 (Tuesdays and Thursdays 2:00PM-3:15PM TNR 352).

Learning Outcomes: I don't want you to be afraid of statistics. I want you to love them and understand how they can help you as a natural resource manager/scientist. Students who satisfactorily complete this course should be able to:

1) Define what statistics are and why we need them;
2) Recognize different data types and choose appropriate graphing techniques for each type;
3) Apply and communicate some basic fundamentals of sampling and experimental design;
4) Recognize the close relationship between management and experimentation;
5) Design your own simple experiments and critique other's experimental design;
6) Select the most appropriate parametric and non-parametric tests for a particular hypothesis; and
7) Communicate some of the current and future trends in Wildlife statistics.

Prerequisites/Co-requisite: MATH 355 – Elementary Statistical Methods. It also will be helpful if you already have taken a Calculus course.

Textbook: The required text book for this course is McKillup (2011) *Statistics Explained: An Introductory Guide for Life Scientists*, 2nd Edition, Cambridge University Press. The book is available as a rental, but I highly recommend that you purchase a copy of your own.

Desire2Learn: Most course material and your grades will be available on Desire2Learn (D2L).

Classroom Climate: It is critical that you feel comfortable exploring your own ideas and asking questions in this class. Please help me to create a classroom that facilitates questions and conversations about the material.

Course Schedule:

Week 1

1/22 Introduction to the course

1/24 Why bother with statistics? (Chapters 1 and 2)

Week 2

1/29 Hypotheses, sample collection, and experimental design (Chapters 3 and 4)

1/31 Hypotheses, sample collection, and experimental design (Chapters 3 and 4)

Week 3

2/5 Hypotheses, sample collection, and experimental design (Chapters 3 and 4)

2/7 Hypotheses, sample collection, and experimental design (Chapters 3 and 4)

Week 4

2/12 Data types, visualization, and communication (Chapter 3)

2/14 To Be Determined

Week 5

2/19 Data types, visualization, and communication (Chapter 3) & Some probability basics (Chapters 6 and 7)

2/21 Exam 1

Week 6

2/26 Introduction to Parametric Statistics and descriptive statistics for populations and samples

2/28 Descriptive statistics for populations and samples

Week 7

3/5 Z-tests and t-tests (Chapters 9 and 10)

3/7 To Be Determined

Week 8

3/12 Z-tests and t-tests (Chapters 9 and 10)

3/14 Z-tests and t-tests (Chapters 9 and 10)

Week 9

3/19 SPRING BREAK

3/21 SPRING BREAK

Week 10

3/26 Single factor ANOVA (Chapter 11)

3/28 Single factor ANOVA (Chapter 11)

Week 11

4/2 Follow-up tests (Chapter 12)

4/4 Two factor ANOVA (Chapter 13)

Week 12

4/9 Exam 2

4/11 Simple linear regression (Chapters 16 and 17)

Week 13

4/16 Simple linear regression (Chapters 16 and 17)

4/18 Introduction to Nonparametric Statistics and Chi-square tests

Week 14

4/23 Chi-square tests & Mann-Whitney test (Chapter 21)

4/25 Mann-Whitney test (Chapter 21) and Kruskal-Wallis test

Week 15

4/30 Information-Theoretic approaches

5/2 Information-Theoretic approaches

Week 16

5/7 Undergraduate presentations (Chapter 5)

5/9 Bayesian approaches

Final Exam

Section 1: Thursday, May 16th from 12:30PM to 2:30PM

Section 2: Wednesday, May 15th from 5:00PM to 7:00PM

Assignments and Scoring:

Written Assignment	50pts
Exam 1	100pts
Exam 2	100pts
Group Project	150pts
Problem Sets	250pts
Final Exam	200pts
Total	**850pts**

Grade	%
A	93+
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	60-66
F	≤ 59