MATH 341: Statistical Methods

Fall 2016   **Section 001**   **3 Credit Hours**

Instructor:	Tom Polaski	**Course Time and Location:**
Office:	Bancroft 152	TR 2:00-3:15 p.m., Owens 103
Office Phone:	803-323-4604	**Office Hours:**
Math Department		M 2:00-3:30 p.m., WR 1:00-2:00 p.m.
Phone:	803-323-2175	TF 10:00-11:00 a.m.
Campus Email:	polaskit@winthrop.edu	Other times may be arranged by appointment.

The instructor reserves the right to make modifications to this syllabus. Students will be notified in class and by email.

Student Learning Objectives – Mathematics Department

1. Students apply fundamental mathematical concepts and techniques to solve problems and evaluate results.
2. Students demonstrate the ability to apply appropriate technologies to the study of mathematics and effectively use such technologies to investigate and develop an understanding of mathematical ideas.

Student Learning Objectives – Statistical Methods

1. Students will demonstrate an understanding of the axiomatic basis for probability.
2. Students will demonstrate the ability to find probabilities using basic combinatorics.
3. Students will investigate mathematical models involving discrete and continuous random variables.
4. Students will demonstrate an understanding of statistical analysis, including confidence intervals, hypothesis testing, and the method of least squares.
5. Students will apply statistical methodologies appropriately to describe and analyze data sets.

Text, Materials and Learning Aids

- Required Text: *Essentials of Mathematical Statistics* by Brian Albright. Burlington: Jones and Bartlett, 2014.
- The ability to use *Mathematica* is a corequisite skill for this course.

Homework Assignments

At the end of each class session, a homework assignment will be made. You are expected to complete the assignment by computing and recording your answers in the Word templates available at the course Blackboard site. *Mathematica* notebooks for appropriate sections of the text are also available at the course Blackboard site and contain data for the exercises. You will then post the completed Word document to Blackboard before 5:00 p.m. on the date of the next class session. Late work will not be graded unless prior arrangements have been made with the instructor. Each homework assignment will be given a grade out of a possible 20 points. At the close of the semester, these homework grades will be averaged and converted to a 100-point scale.

Tests and Grading
There will be three 100-point tests given along with a 200-point cumulative final examination. No make-up tests will be given unless prior arrangements have been made with the instructor. A point system will determine your final grade. There are 600 points possible; 300 from the tests, 100 from the homework assignments, and 200 from the final. An approximate grading scale for each test and the homework assignments will be determined after they are graded. The semester grading scale will be based upon these grading scales and on the scale for the final examination. Plusses and minuses are awarded at the discretion of the instructor.

Attendance Policy
Attendance at all scheduled class meetings is strongly encouraged. Your number of absences will not be counted, and will not be used directly to determine your grade. However, attendance is mandatory for those class sessions which include a test. If no prior arrangements are made with the instructor, a zero will be recorded for a test not taken due to absence.

Equal Access to Education
Winthrop University is dedicated to providing access to education. If you have a disability and need specific accommodations to complete this course, please contact the Office of Accessibility (OA) at 323-3290 as early as possible in the semester. Once you have your official notice of accommodations from the Office of Accessibility, please inform your instructor.

Academic Integrity
Review the student code of conduct for university polices on academic misconduct. Academic misconduct will not be tolerated and will result in a failing grade on the assignment and/or in the course. The full handbook is available online at
http://www2.winthrop.edu/studentaffairs/handbook/StudentHandbook.pdf.

Electronic Devices
All electronic devices (including cell phones) other than a calculator should be on silent and kept in your book bag or purse throughout class time unless otherwise instructed. NOTE: if you have some educational, health, or physical reason for an electronic device you must notify your instructor of this accommodation.

Tentative Course Schedule

	Date	Section(s)	Topics
T	8/23	4.1	Introduction; What is Statistics
R	8/25	4.2	Summarizing Data
T	8/30	1.2-1.7	Almost All of the Probability You Will Need for This Course
R	9/1		NO CLASS
T	9/6	2.2,2.3	Random Variables; Probability Mass Functions; The Binomial Distribution
R	9/8	2.5,2.6	Mean, Variance, and Functions of a Random Variable
T	9/13	3.1-3.4	Densities and Distribution Functions; Uniform and Normal Distributions
R	9/15	3.5,3.8	Functions of Continuous Random Variables; The Central Limit Theorem
T	9/20	4.4	Sampling Distributions
R	9/22		**Test 1**
T	9/27	4.5,4.6	Confidence Intervals for Proportions and Means
R	9/29	4.8,4.9	Confidence Intervals for Differences; Sample Size
T	10/4	5.1,5.2	Hypothesis Testing; Testing Claims about a Proportion
R	10/6	5.2,5.3	Type I and Type II Errors; Testing Claims About a Mean
T	10/11	5.4,5.6	Comparisons of Two Proportions and Two Means
R	10/13	5.9, 5.10	One-Way and Two-Way ANOVA
T	10/18	6.2	Covariance and Correlation
R	10/20	6.3	**Test 2**
T	10/25	6.3	The Method of Least Squares
R	10/27	6.4	The Simple Linear Model
T	11/1	6.5	Sums of Squares and ANOVA
R	11/3	6.6	Nonlinear Regression
T	11/8		NO CLASS
R	11/10	6.7	Multiple Regression
T	11/15	7.2	Nonparametric Statistics: The Sign Test
R	11/17	7.3	Nonparametric Statistics: The Signed Rank Test
T	11/22	7.4	Nonparametric Statistics: The Rank-Sum Test
T	11/29		**Test 3**
R	12/1		Review and Evaluation

Add/Drop: Through F 8/26   **SU/Course Withdraw Date:** F 10/21

Fall Break: F 10/14 and M 10/17   **Final Exam:** W 12/7 11:30 a.m.