

COURSE SYLLABUS
STAT 145: INTRODUCTION TO PROBABILITY AND STATISTICS
SUMMER 2015

I. GENERAL INFORMATION

Instructor: Julie DePree, Ph.D.

Phone Number: 925-8607

Office Hours: T&Th 1:00-1:30 and 4:00-4:30
or by appointment

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- II. COURSE DESCRIPTION: The prerequisite for STAT 145 is Math 120 with a minimum grade of C or a sufficient placement test score for placement in Math 121, Math 150 or Calculus. **The Department of Mathematics and Statistics Policy is that if a student does not meet a prerequisite for a course, then that student will be dropped from the course.**

This course provides an introduction to basic concepts of statistics: descriptive statistics; sampling; inferential methods of t-tests, and simple linear regression and contingency table analysis. Emphasis is on concepts and intuitive understanding, stressing a wide variety of relevant applications.

III. COURSE STUDENT LEARNING OUTCOMES:

1. Descriptive Statistics, Data Production and Inference: Students will learn basic vocabulary, logic, and procedures for data exploration, data production, and statistical inference.
(Addresses UNM/ HED Area II: Mathematics Other College-Level Competency 1)
2. Data Exploration: Students will understand principles of data exploration and differentiate between quantitative and categorical variables. Students will illustrate by way of graphs and the use of tables how to interpret data. They will identify the underlying principles and measures used to analyze this data.
(Addresses UNM /HED Area II: Mathematics Other College-Level Competencies 1 & 2)
3. Procedures for data production: Students will demonstrate that they can use tables of random numbers to perform simple random sampling to obtain samples from populations. They will show that they can distinguish differences between observational studies and experiments. Students will demonstrate techniques for the design of a controlled experiment.
(Addresses UNM /HED Area II: Mathematics Other College-Level Competencies 2 & 3)
4. Probability theory: Students will be able to use the basic rules for probability to solve problems, working with simple models, both discrete and continuous. Students will demonstrate an understanding of probabilities related to random variables.
(Addresses UNM /HED Area II: Mathematics Other College-Level Competencies 1, 2, 3)
5. Sampling Distributions: Students will be able to recognize and apply the terms population, sample, parameter and statistics as they pertain to sampling distributions. They will apply the concept of the Law of Large Numbers and Central Limit Theorem. They will demonstrate the ability to obtain the sampling distribution of sample means and spread of a population.
(Addresses UNM /HED Area II: Mathematics Other College-Level Competencies 1, 2, 3)
6. Making Inferences: Students will demonstrate an understanding for the procedures involved in making inferences about quantitative populations.
(Addresses UNM /HED Area II: Mathematics Other College-Level Competencies 1, 2, 3)
7. Tests for Independence of two categorical variables: Students will be able to interpret 2-way tables, stating hypothesis, calculating expected counts and using Chi Square distribution to test for independence.
(Addresses UNM /HED Area II: Mathematics Other College-Level Competencies 1, 2, 3)

IV. COURSE REQUIREMENTS:

- A. Instructional Methods: Group work, demonstrated problem solving, projects, discussion, review, lecture and scheduled testing may be employed.
- B. Evaluation of Students: Evaluation may be based on homework quizzes, projects, group work, exams, and a final exam. Missed quizzes and projects cannot be made up; although one quiz/project grade will be dropped before final grades are computed.
- C. Attendance: **Students enrolled for credit or audit are expected to attend all class sessions. Students with excessive absences (4) may be dropped from the class.**
- V. TEXTS/MATERIALS:Text: Gould/Ryan, *Introductory Statistics: Exploring the World Through Data*, Calculator - TI83 or TI84 PLUS. A limited number of calculators are available for check out. Stat 145 DePree packet of handouts – available in the bookstore
- VI. EXPECTATIONS: Students are expected to conduct themselves in a professional and collegial manner. Please refrain from using cell phones during class unless approved in advance by instructor.
- VII. DISABILITY STATEMENT: If you have a documented disability, please provide me with a copy of your letter from Equal Access Services as soon as possible to ensure that accommodations are provided in a timely manner.
- VIII. UNM's POLICY ON DISHONESTY IN ACADEMIC MATTERS: Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, including dismissal, against any student who is found responsible for academic dishonesty. Any student who has been judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course.
Academic dishonesty includes, but is not limited to, dishonesty in quizzes, tests or assignments, claiming credit for work not done or done by others; hindering the academic work of other students; and misrepresenting academic or professional qualifications within or outside the University.
- IX. STUDENT SUPPORT: The Valencia Campus Library provides a quiet atmosphere for study and is an excellent resource for supplementary materials. The Learning Center offers tutorial and individualized instruction at no cost to the student.
- X. COURSE GRADING PROCEDURES:

Grading Scale:

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| A | 91 - 100% |
| B | 81 - 90% |
| C | 71 - 80% |
| D | 61 - 70% |
| F | 0 - 60% |

The student's grade will be based on the following:

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| Homework Quizzes and Group Projects | 15% |
| Mini Projects and/or Excel Projects | 10% |
| Exams | 45% |
| Final Exam | 30% |

Course Outline:

| WEEK | TOPIC | CHAPTER |
|------------------|---|-----------------|
| 1 6/2 – 6/4 | Introduction to Data Graphs Group Project: Beware of Deceptions & Excel Introduction Start Ch. 3 | 1 2 |
| 2 6/9 – 6/11 | Numerical Summaries of Center and Variation Group Project: Mean, Median, Mode Exploration Group Project: Light Bulb Problem and Heights Regression Analysis: Association between Variables | 3 4 |
| 3 6/16 – 6/18 | Correlation and Regression Group Project: Pass the Book Modeling Variation with Probability Group Project: Rock, Paper and Scissors | 4 5 |
| 4 6/23 – 6/25 | EXAM 1 Modeling Random Events: The Normal and Binomial Models Group Project: Coin Flip | 6 |
| 5 6/30 – 7/2 | Finish Ch. 6 Survey Sampling and Inference Central Limit Theorem Group Project: Random Sample on TI83 and Monday Blues | 6 7 7 & 9 |
| 6 7/7 – 7/9 | Confidence Intervals Group Project: Confidence Intervals Hypothesis Testing for Population Proportions Group Project: Hypothesis Testing | 7 8 & 9 |
| 7 7/14 – 7/16 | Hypothesis Testing Group Project: Hypothesis Testing EXAM 2 | 8 & 9 |
| 8 7/21 – 7/23 | Comparing Two Groups Group Project: Hypothesis Testing Association between Categorical Variables Review Mini Projects and Excel Projects Due 7/21 Final Exam 7/23 | 9 10 |