

**Chemeketa Community College**  
4000 Lancaster Drive NE  
PO Box 14007  
Salem, Oregon 97309-7070

**Course Outline**

<b>Course Identification</b>	<u>          MTH243          </u>	<b>Credits</b>	<u>          4          </u>	<b>Date</b>	<u>          12/05          </u>
------------------------------	-----------------------------------	----------------	------------------------------	-------------	----------------------------------

**Course Title:** Probability and Statistics 1

**Total Instructional Hours, for Course, per Term:**

<u>44</u> Lecture Hours	=	<u>4</u> Credit(s)
<u>0</u> Laboratory Hours	=	<u>0</u> Credit(s)

**Prerequisite Course(s):**

Grade of C or better in MTH111 College Algebra or equivalent

**Required Text(s) and Materials:**

Triola, Mario F., *Elementary Statistics*, 2004, 9<sup>th</sup> Edition, Addison Wesley,  
ISBN 0-201-77570-0  
Graphing calculator required

**Optional Text(s):**

Loyer, Milton, Student Solutions Manual, 2001, 8<sup>th</sup> Edition, Addison Wesley,  
ISBN 0-201-70465-X  
Halsey and Reda, Excel Student Laboratory Manual and Workbook, Addison Wesley,  
ISBN 0-201-70459-5  
Morgan, Larry, TI-83 Plus Companion to Elementary Statistics, 8<sup>th</sup> Edition, 2001,  
Addison Wesley; ISBN 0-201-70569-2

**Course Description:**

Introduces descriptive statistics. Covers data analysis, regression and correlation, counting and probability, common probability distributions, sampling, confidence intervals and one-sample hypothesis testing.

**Performance Based Learner Outcomes:**

Upon successful completion of the course, students should be able to:

1. Use mathematical problem solving techniques to organize, represent and analyze data. Techniques include the use of, but are not limited to, frequency distributions, histograms, pareto charts, measures of central tendency, measures of variation, measures of position, measures of significance, correlation and regression.
2. Create models of real world situations using probability and statistical methods.
3. Use inductive reasoning to develop mathematical conjectures using probability and statistics. Use deductive reasoning to verify and apply mathematical arguments using probability and statistics.
4. Make mathematical connections to, and solve problems from, other disciplines as it applies to probability and statistics.

5. Use oral and written skills to individually and collaboratively communicate about applications as it applies to probability and statistics.
6. Use appropriate technology to solve mathematical problems and to enhance mathematical thinking and understanding of probability and statistics; and judge the reasonableness of results.

**Course Content:**

- I. **Number Sense:** Calculate and interpret numerical measures of central tendency and dispersion, number of simple events using counting rules, standard probability terms, z- scores, confidence intervals, and tests of hypothesis. Estimate reasonableness of numerical results.
- II. **Symbolism:** Translate problem situations into symbolic representations and find their solutions by appropriate graphical, numerical, and algebraic methods. (Symbolic representations will include permutations and combinations, expected value, binomial probabilities, large-sample estimation of a population mean and binomial proportion.) Construct valid deductive arguments.
- III. **Problem Solving:** Apply appropriate mathematical concepts and models, including sampling distributions, confidence intervals, and hypothesis testing to solve abstract and real-world problems.
- IV. **Technology:** Use a spreadsheet or graphing calculator to investigate the nature of statistics to aid in numerical calculations and facilitate simulations.
- V. **Communication:** Communicate mathematical ideas using appropriate terminology by reading, writing, listening and speaking in group and individual settings. Do guided group activities to discover and explore statistical concepts.

**Course Content Outline**

- I. Introduction to Statistics
  - A. The Nature of Data
  - B. Uses and Abuses of Statistics
  - C. Design of Experiments
- II. Describing, Exploring, and Comparing Data
  - A. Summarizing Data and Pictures of Data
  - B. Measures of Central Tendency, Variation and Position
  - C. Exploratory Data Analysis
- III. Counting and Probability
  - A. Fundamentals of Probability and Addition Rule
  - B. Multiplication Rule
  - C. Simulations
- IV. Probability Distributions
  - A. Random Variables
  - B. Binomial Probability Distribution
  - C. Mean and Standard Deviation of the Binomial Distribution

- V. Normal Probability Distributions
  - A. The Standard Normal Distribution
  - B. Non-Standard Normal Distributions: Finding Probabilities and Scores
  - C. The Central Limit Theorem
  - D. Normal Approximation to Binomial
- VI. Estimates and Sample Sizes
  - A. Estimating a Population Mean: Large and Small Samples
  - B. Estimating a Population Proportion
  - C. Estimating a Population Standard Deviation or Variance
  - D. Determining Sample Size
- VII. Hypothesis Testing
  - A. Testing a Claim about a Mean: Large and Small Samples
  - B. Testing a Claim about a population Proportion
  - C. Testing a Claim about a Population Standard Deviation or Variance
- VIII. Regression and Correlation
  - A. The Regression Model
  - B. The Meaning of Correlation