

# El Paso Community College

## Syllabus

### Part II

## Official Course Description

<b>SUBJECT AREA</b>	<u>Mathematics</u>
<b>COURSE RUBRIC AND NUMBER</b>	<u>MATH 0400</u>
<b>COURSE TITLE</b>	<u>College Prep Statistics</u>
<b>COURSE CREDIT HOURS</b>	<u>4      4    :    0</u>
	Credits   Lec    Lab

### I.      **Catalog Description**

The course is the first in a two-semester course, to be paired with a designated MATH 1342 section in the second semester. This course surveys a variety of mathematical topics needed to prepare students for the statistical reasoning and data analysis needed in MATH 1342. Topics include: arithmetic with rational numbers; linear models; evaluating expressions and formulas; rates, ratios, and proportions; percentages; solving equations and inequalities; data interpretations including graphs and tables; verbal, algebraic and graphical representations of functions; exponential models; and an introduction to other models, including quadratic, logarithmic, and/or rational. In order to be prepared for Math 1342 students who complete Math 0400 with a "C" or better MUST enroll in a Math 1342 section concurrently with Math 0142. Students will not be allowed to only enroll in a Math 1342 section without concurrent enrollment in Math 0142.

**Prerequisite: MATH 0301 with a "C" or better or by placement exam. (4:0).**

### II.     **Course Objectives**

Student Learning Outcomes:

Upon satisfactory completion of this course, the student will:

- A.      Have the ability to use mathematics to solve problems of interest to them or useful in their chosen fields.
- B.      Attain more positive attitudes based on increasing confidence in their abilities to learn mathematics.
- C.      Learn to understand material using standard mathematical and statistical terminology and notation when presented either verbally or in writing.
- D.      Improve their skills in describing what they are doing as they solve problems using standard mathematical and statistical terminology and notation.

Specific objectives: Upon satisfactory completion of this course, the student will be able to:

1.      Solve multiple-step problems.
2.      Solve application problems requiring careful reading and the selection of relevant information from a more extensive set of given information.
3.      Use order of operations to evaluate numerical expressions on a scientific calculator.
4.      Produce and interpret graphs of two-variable data and distinguish between the variables having an exact relationship and a non-exact relationship.
5.      Use graphs to approximate the solution of equations of the form  $y = f(x)$  for  $x$ .
6.      Work percentage problems including those based in two-way tables.
7.      Solve linear equation and inequalities in one variable.
8.      Identify when a relationship between two variables is linear and use linear models.

9. Identify when a relationship between two variables is proportional and use proportional models.
10. Identify when a relationship between two variables is exponential and use exponential models.
11. Use an appropriate exponential model to answer a question and be able to convert between parameters.

The course will be taught using Lessons from Modules written by the Carnegie Foundation for the Advancement of Teaching. The lessons include all the objectives of the course stated above and introduced in lessons where students learn *concepts and methods of statistics with an emphasis on data collection and descriptive statistics interwoven by topics that include methods for collecting data, graphical and numerical descriptive statistics, correlation, simple linear regression, and basic concepts of probability.*

**Statway Goals and Student Learning Outcomes:**

S.1. Data Collection Goal: Students will understand the data collection process and the characteristics of well-designed statistical studies.

Learning Outcomes for Goal S.1

Students will be able to:

- S.1.1 Develop a plan for a statistical study.
  - a. Given a real-world problem, formulate a question that can be addressed by data.
  - b. Identify appropriate data that can be used to address the question.
  - c. Select an appropriate data collection strategy to address a question of interest.
- S.1.2 Know the type and scope of conclusions that can be drawn from different types of statistical studies (e.g., surveys, other observational studies, experiments).
- S.1.3 Know the characteristics of good sampling plans (e.g., representative of larger population, minimize sources of bias and variability), well-designed experiments (e.g., random assignment, replication, control, blocking), and well-designed observational studies (e.g., recognizing potential sources of bias).
- S.1.4 Critically evaluate all aspects of a study.

S.2. Distributional Thinking Goal: Students will demonstrate the use of distributional thinking to reason about the data in order to describe and summarize distributions of data, identify trends and patterns, judge the fit of a model to a distribution, and describe similarities and differences in comparing distributions.

Distributional thinking involves the ability to consider a collection of individual observations as an entity (instead of focusing on individual observations) and to consider characteristics of the distribution to reason about the data.

Learning Outcomes for Goal S.2

Students will be able to:

- S.2.1 Given a data set of a particular type (i.e., numerical, categorical, bivariate numerical, bivariate categorical, or time series),
  - a. Display the data using appropriate graphical displays.
  - b. Summarize the data using appropriate numerical summaries.
  - c. Describe the data distribution in context.
  - d. Viewing data as a model plus error, assess the appropriateness of potential models (e.g., normal distribution as a model for numerical data, the least squares regression line as a fit to bivariate numerical data, independence as a model for bivariate categorical data, linear or exponential growth as a model for time series data).
- S.2.2 Recognize different representations of the same data distribution (e.g., dotplot, boxplot, histogram) and understand how numerical summaries are related to characteristics of the data distribution (e.g., extreme left skew tends to have mean < median; the effect of outliers and influential observations).

S.2.3 Make meaningful and appropriate comparisons of distributions of data collected from two or more different groups.

S.3. Statistical Evidence Goal: Students will demonstrate an ability to use appropriate statistical evidence to reason about population characteristics and about experimental treatment effects.

Learning Outcomes for Goal S.3

Students will be able to:

- S.3.1 Demonstrate a basic understanding of probability.
- a. Interpret a probability.
  - b. Estimate probabilities (including conditional probabilities) empirically and using simulation.

### III. Evaluation

a. **Pre-assessment**

Instructors will check prerequisites for every student during the first day(s) of class. Students without the proper prerequisites for the class will be sent to the registrar to revise their schedules.

b. **Homework and other Assignments:**

Reading Assignments: Reading assignments are required and may include but, are not limited to, the following:

- assigned handouts or pages in the text
- articles from external sources such as periodicals and/or websites

Assignments that Demonstrate Critical Thinking: Critical thinking assignments are required and may include, but are not limited to, the following:

- analyzing graphs from a variety of sources, including newspapers, magazines and/or websites
- collecting and analyzing data
- interpreting statistical analyses

Outside Assignments: Outside assignments may include, but are not limited to, the following:

- appropriate reading assignments
- formative tasks including calculations and written explanations
- summative conceptual activities including calculations and written explanations
- statistical analyses

Writing Assignments: Writing assignments are required and may include, but are not limited to, the following:

- explanations of the results of statistical analyses
- explanations of statistical concepts
- applications of representative symbol systems
- analysis of graphs and/or polls from the news

c. **Post-Assessment**

It is recommended that students be assessed with:

4 unit exams worth 100 points each	400 points
Homework/Quizzes and Other Graded Assignments	200 points
Comprehensive final exam	200 points

This recommended assessment would give a student a total of 800 possible points which when divided by eight, rounded to the nearest unit, and would give an average to determine the grade for the course based on the following scale.

- A = 90 – 100
- B = 80 – 89
- C = 70 – 79
- D = 60 – 69
- F = Below 60 or for academic dishonesty

d. **I and W Grades**

The student is responsible for completing the necessary forms for I or W grades (except as noted below). I and W grades may be assigned whenever appropriate deadlines are met. To be eligible for an Incomplete, I, the student must complete 80% of the course work with at least a 75% average. The proper forms must also be signed by both the student and the instructor before being submitted to the registrar.

**IV. Disability Statement (American with/Disabilities Act [ADA])**

EPCC offers a variety of services to persons with documented sensory, mental, physical, or temporary disabling conditions to promote success in classes. If you have a disability and believe you may need services, you are encouraged to contact the Center for Students with Disabilities to discuss your needs with a counselor. All discussions and documentation are kept confidential. Offices located: VV Rm C-112 (831-2426); TM Rm 1400 (831-5808); RG Rm B-201 (831-4198); NWC Rm M-54 (831-8815); and MDP Rm A-125 (831-7024).

**V. 6 Drop Rule**

Students who began attending Texas public institutions of higher education for the first time during the Fall 2007 semester or later are subject to a 6-Drop limit for all undergraduate classes. Developmental, ESL, Dual Credit and Early College High School classes are exempt from this rule. All students should consult with their instructor before dropping a class. Academic assistance is available. Students are encouraged to see Counseling Services if dropping because exemptions may apply. Refer to the EPCC catalog and website for additional information.