

## *Fall 2019 Course Syllabus*

**Math 120/20 — Elementary Statistics with Support**

**Professor Tim Busken**

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**Sections #77415 and #77427**

**Mon. and Wed. 7:00am – 10:05am**

**Room: NS-260**

**Course Description:** The use of probability techniques, hypothesis testing and predictive techniques to facilitate decision-making. Topics include descriptive statistics, probability and sampling distributions, statistical inference, correlation and linear regression, analysis of variance, chi-square and t-tests, and application of technology for statistical analysis, including interpretation of the relevance of the statistical findings. Applications using data from disciplines including business, social sciences, psychology, life science, health science and education.

### **Course Objectives:**

1. Distinguish among different scales of measurement and their implications;
2. Interpret data displayed in tables and in graphs;
3. Apply concepts of sample space and probability;
4. Calculate measures of central tendency and variation for a given data set;
5. Identify the standard methods of obtaining data and identify advantages and disadvantages of each;
6. Calculate the mean and variance of a discrete distribution;
7. Calculate probabilities using normal and t-distributions;
8. Distinguish between sample and population distributions and analyze the role played by the Central Limit Theorem;
9. Construct and interpret confidence intervals;
10. Determine and interpret levels of statistical significance including p-values;
11. Interpret the output of a technology-based statistical analysis;
12. Identify the basic concept of hypothesis testing including Type I and Type II errors;
13. Formulate hypothesis tests involving samples from one and two populations;
14. Select the appropriate technique for testing a hypothesis and interpret the result;
15. Use linear regression and ANOVA analysis for estimation and inference and interpret the associated statistics;
16. Using applications from business, social sciences, psychology, life science, health science and education apply appropriate statistical techniques to draw conclusions.

## Student Learning Outcomes:

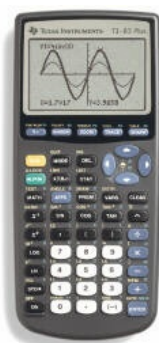
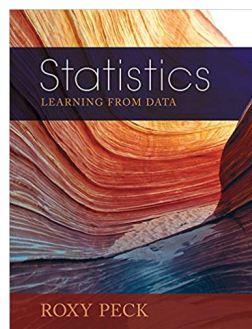
1. Compute appropriate descriptive statistics.
  2. Students will be able to construct and interpret graphs such as bar charts, histograms and box plots.
  3. Choose and apply inferential analyses in order to draw conclusions about a population.
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## 3 Required Materials:

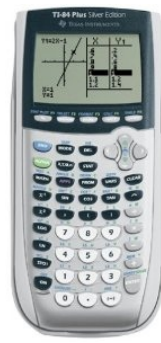
1. the textbook (physical or digital copy)  
*Link to Chapters 1 –3 Free:*  
[http://www.nxtbook.com/nxtbooks/ngsp/statistics\\_learningfromdata/index.php](http://www.nxtbook.com/nxtbooks/ngsp/statistics_learningfromdata/index.php)
2. TI-83+ or TI-84+ calculator (I recommend you buy a used one or rent one)
3. statcrunch spreadsheet software \$13  
*How to get it:* [statcrunch.com/get-access/](http://statcrunch.com/get-access/)

**Textbook:** Statistics Learning From Data, Roxy Peck, 1st Ed.  
Publisher: Cengage.

You will need a physical or digital copy of the textbook for homework and reading assignments. You can purchase a cheap, used copy or new copy if you like.



TI-83 plus



TI-84 plus

**Calculator:** The Texas Instruments TI-83 plus or TI-84 plus. The calculators are also available for free on-campus use at the Math Learning Centers at all college sites. Bring your calculator to all on-campus exams and classes. Students may not share calculators during exams. Phone calculators are not allowed during exams.

**Free Online Calculator:** You may want to use this free online TI-83+ calculator outside of the classroom. It does not work on apple devices though.  
<https://sites.google.com/site/ti83interactivecalculator>

**TI-83 Calculator on your Android device for FREE** - Instructions Guide in 'FILES' on CANVAS

<b>Grading:</b>	Homework	5%
	Labs	10%
	Project	10%
	Test 1	15% (Chapters 1, 2, 3)
	Test 2	15% (Chapters 4, 6,7 and 8)
	Test 3	15% (Chapters 9, 10, 11)
	Test 4	15% (Chapters 12, 13, 15)
	Cumulative Final	15%

Numerical course grades are rounded to the nearest whole percentage and translate to a letter grade.  
 A= 90%-100%    B=80%-89%    C=70%-79%    D=60%-69%    F=0%-64%

**Online Gradebook:** The online gradebook is available when you login to Palomar's 'Canvas'

**Labs** There will be roughly 10 or so labs. Labs are due at the beginning of class on the due date. Late labs will likely not be accepted. *I will drop your lowest lab score.* The main purpose of these labs is to teach you the procedures for using both statistical and spreadsheet software and the TI83/84 calculator for performing computations and obtaining graphs and tables.

**Homework:** Problems from the textbook will be assigned for you to complete on paper and turn in on the day of the test. The list of homework problems is on the CANVAS homepage. Late homework will not be accepted. There will be four homework grades entered into the gradebook on canvas.

**Tests:** I do not drop any test. Practice tests will be given before each test, but you need to study the labs and the homework in addition to the practice tests. If for any reason, you must miss class on the day of a quiz or exam, you must make arrangements with me in advance for taking the test at some other time. I may ask you to provide documentation supporting why you are unable to take the exam.

**Formula Sheet for Tests:** You are allowed to make and use a formula sheet for each test. This formula sheet may only occupy one side of one sheet of a regular size (8.5 in by 11 in.) piece of paper. Worked example problems are not allowed! Only formulas, definitions and procedural comments (a list of steps required to carry out a multi-step process or calculation) are allowed. If you have a question about what is allowed on the formula sheet, please ask me before the test. During the time you spend working on homework and practice tests, please be thinking about what you will need to have on that sheet and write it down. I would encourage you to not wait until the last minute to make your formula sheet.

**Accommodation:** Any student who may need an academic accommodation should discuss the situation with me during the first week of class. Students with disabilities who may need accommodations in this class are encouraged to contact [Disability Resource Center \(DRC\)](#) early in the semester so that reasonable accommodations may be implemented as soon as possible. Students may contact DRC in person or by phone at 760-744-1150 ext. 2375.

**Attendance Policy:** Grades are not based on attendance, but attending class, arriving on time, being prepared with questions, and staying for the entire class are critical for student success. Dur-

ing the first week of class, if you are not present at any time during any class meeting you may be dropped

### **Cheating Policy:**

Violations of the academic dishonesty policy will be treated quickly and harshly. A student found in violation may receive a failing grade on that assignment or test, and will have this infraction reported to the college. I do not tolerate academic dishonesty in any form. Palomar College requires reporting of ALL instances of academic dishonesty as Academic Integrity Violations. These include:

- looking at another person's exam during a testing situation
- copying another student's lab and submitting it as your own
- bringing in and using notes or supplemental materials that are allowed
- allowing another student to copy your work and submit it – you will be punished exactly the same as the person who did the copying. To avoid this, don't give your work to someone else. Working together means sharing ideas and discussing concepts, and is acceptable; each student must independently write their own solutions and responses.

**Academic Integrity:** Students are expected to conduct themselves in accordance with Palomar's *Standards of Student Conduct* (AP 5500). Disruptive behavior, threats, harassment, willful disobedience, cheating, plagiarism, or other forms of academic dishonesty are not acceptable and will not be tolerated. Students are expected to conduct themselves in an ethical manner that promotes a safe and harmonious learning environment while on the campus. Charges of misconduct and disciplinary sanctions may be imposed upon those who violate these standards of conduct, or provisions of college regulations. When a violation of the *Standards of Student Conduct* occurs, AP 5520: *Student Discipline Procedures* will be followed.

- ***Standards of Student Conduct***

<http://www2.palomar.edu/pages/studentaffairs/files/2011/10/AP-5500-Standards-of-Student-Conduct-approved-12-1-2015.pdf>

- ***Student Discipline Procedures***

<http://www2.palomar.edu/pages/studentaffairs/files/2011/10/Student-Disciplinary-Procedures-AP5520.pdf>

**Resources:** Keeping up is important, as is getting help if you feel lost. Help is available! The following resources are at your disposal:

1. Professor – You can ask me specific questions during class, get help with math study habits, discuss any other problems you feel you are having with the course.
2. Study groups - Form a study group with other students in the class. You will find that you can solve harder problems and write better solutions by working together. Discussing ideas with others in a group setting is a good way to improve your own understanding.
3. Mathematics Learning Center and Computer Lab – (Main Campus) The Mathematics Learning Center provides tutoring on a walk-in basis, computer tutorials for individual practice and review and a group study area. The center is located on the San Marcos campus in room MC-1. They are open Monday through Friday from 8am to 4pm. They are closed, however, on the following Fridays: 6/21, 7/5 and 7/19.

4. TLC Tutoring – (Escondido Campus) Palomar College offers tutoring and study group support at the Teaching & Learning Center (TLC). In addition to providing a quiet, comfortable space to work in where you can get tutor help, TLC has three small rooms for group study, wireless internet, computers, printing stations and more

**Drop Policy:** If you decide to drop the course, use ESERVICES to drop yourself. Don't wait for me to drop you automatically. If I drop you and you want to be reinstated, see me quickly.

### **OUTLINE OF COURSE CONTENT**

The course will address the following topics:

#### **I. Data**

- A. Methods of data collection
- B. Summarizing data numerically and graphically
  1. Frequency distribution
  2. Bar graph
  3. Histogram
  4. Stem-and-leaf plot
  5. Box-and-whisker plot

#### **II. Descriptive Statistics**

- A. Measures of central tendency
- B. Measures of variation
- C. Measures of relative position
- D. Levels/scales of measurement

#### **III. Probability**

- A. Sample spaces and events
- B. Computing probabilities
- C. Counting techniques
  1. Permutations
  2. Combinations
- D. Random variables and expected values

#### **IV. Distributions**

- A. Central Limit Theorem
- B. Sampling distributions
  1. Mean
  2. Proportion
- C. Discrete distributions
  1. Binomial

2. Geometric (optional)
3. Poisson (optional)

**D. Continuous distributions**

1. Uniform
2. Normal
3. t-distribution
4. F-distribution
5. Chi-square

**V. Inferential Statistics**

**A. Estimation of parameters**

**B. Confidence Intervals**

1. Mean
  - a. Known standard deviation
  - b. Unknown standard deviation
2. Proportion
3. Difference of means
  - a. Known standard deviation
  - b. Unknown standard deviation
4. Difference of proportions

**C. Hypothesis Testing**

1. Mean
  - a. Known standard deviation
  - b. Unknown standard deviation
2. Proportion
3. Difference of means
  - a. Known standard deviation
  - b. Unknown standard deviation
4. Chi-square test for independence
5. ANOVA (Analysis of Variance)

**D. Correlation and Regression**

1. Analyzing relationships between two variables
2. Scatter diagrams
3. Regression lines
4. Strength of regression relationship using correlation coefficient

**VI.** Applications using data from disciplines including business, social sciences, psychology, life science, health science and education.

**VII.** Statistical analysis using technology such as SPSS, Excel, Minitab or graphing calculators.

**VIII.** Additional topics may be included at instructor's discretion.



## Math 20 COURSE OUTLINE FOR CREDIT COURSE

### Basic Course Information

Courses numbered 1 - 49 are remedial or college preparatory courses which do not apply toward an A. A. Degree and are not intended for transfer. Courses numbered 50-99 apply toward an AA Degree, but are not intended for transfer. Courses numbered 100 and higher apply toward an AA Degree and/or are intended for transfer to a four-year college or university.

**Discipline:** MATH

**Course Number:** 20

**Title:** Support Course for Introductory Statistics

### Units and Hours

**Units:** 2.00

**Grade Option:** Pass/No Pass Only

**Course Length in Weeks:** Min Weeks - 16 Max Weeks - 18

#### Semester Hours

Hour Type	Hours	Min Semester Hours	Max Semester Hours
Lecture Category	2.00	32.00	36.00
Lab Category	0.00	0.00	0.00
Subtotal	2.00	32.00	36.00
Out of Class Hour	4.00	64.00	72.00
Totals	6.00	96.00	108.00

**Grading Basis:** Pass/No Pass Only

**Basic Skills Requirements:** Appropriate Language and/or Computational Skills.

### Requisites

To satisfy a prerequisite, the student must have earned a letter grade of A, B, C or P(Pass) in the prerequisite course, unless otherwise stated.

<b>Prerequisite:</b> Eligibility determined through the mathematics placement process
<b>Corequisite (Course required to be taken concurrently):</b> MATH 120
<b>Prerequisite: (Completion of, or concurrent enrollment in):</b> None
<b>Recommended Preparation:</b> None
<b>Limitation on Enrollment (e.g. Performance tryout or audition):</b> None

### Catalog Description

The core mathematical skills needed to understand the concepts, formulas, and graphs used in transfer-level statistics are studied. This course integrates numeracy, proportional reasoning, algebraic reasoning, and functions. It develops conceptual and procedural tools that support the use of key mathematical concepts in a variety of statistical contexts. Throughout the course, college success content will be integrated with mathematical topics.

## Student Learning Outcomes

Upon successful completion of the course, the student will be able to:

1. Statistical Support Apply and interpret geometric and statistical reasoning to solve problems in a variety of contexts.
  2. Statistical Numeracy Apply concepts of numeracy in multiple contexts.
  3. Statistical Reasoning Recognize proportional relationships and use proportional reasoning to solve problems.
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## Specific Course Objectives

Upon successful completion of the course, the student will be able to:

1. Apply concepts of numeracy in multiple contexts;
  2. Recognize proportional relationships and use proportional reasoning to solve problems;
  3. Use the language of algebra to write relationships involving variables, interpret those relationships, and solve problems;
  4. Interpret and move flexibly between multiple representations of functions and problems including graphs, tables, equations and verbal representations;
  5. Demonstrate success skills including perseverance, time management, and appropriate use of resources;
  6. Apply and interpret geometric and statistical reasoning to solve problems in a variety of contexts;
  7. Develop the ability to think critically and logically to solve problems in a variety of contexts using the tools of mathematics, including technology.
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## Methods of Instruction

Methods of Instruction may include, but are not limited to, the following

1. Demonstration
2. Group Projects/Activities
3. Discussion
4. Lecture
5. Other (Specify)

### Other Method(s)

Instruction must include active learning techniques involving multiple modalities including individual and/or group active learning project/activities

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## Content in Terms of Specific Body of Knowledge

At least the following topics will be covered:

Using a just-in-time approach,

1. Numeracy and Proportional Reasoning
  - a. Number lines
    - i. Location of numbers
    - ii. Relationships between two numbers: less than, equal to, greater than
    - iii. Intervals
      - A. at most, at least, less than, greater than
      - B. compound inequalities
  - b. Ratios and rates
  - c. Unit measure and dimensional analysis to convert between units
  - d. Scientific notation
  - e. Proportional relationships from verbal and numeric representations
  - f. Decimal numbers, percentages, and fractions
  - g. Rounding rules
  - h. Appropriate use of technology, such as calculators and Excel
2. Functions and Algebraic Reasoning
  - a. Variables and formulas
    - i. Operations using variables



- ii. Use of variables as indeterminates, unknowns, and in formulas
    - iii. Evaluation of expressions with real numbers using the Order of Operations Agreement
    - iv. Evaluation of formulas
    - v. Rules of exponents
    - vi. Solve a formula for a variable
  - b. Function notation and evaluation
  - c. Compare discrete and continuous functions
  - d. Characteristics of functions including points, intercepts, inputs and outputs, and slopes of linear functions
  - e. Compare the predictive ability of mathematical models to actual data, in the context of regression
  - f. Linear functions and equations
    - i. Plot points on the xy plane
    - ii. Graphs
    - iii. Slope and y-intercept in context
    - iv. Linear equations in one variable
    - v. Linear inequalities in one variable, including compound inequalities
  - 3. Introduction to Sets
    - a. Venn diagrams
    - b. Unions and intersections
  - 4. Success Skills in Mathematics Courses
    - a. Study and Learning skills
      - i. Organization and time management
      - ii. Test preparation and test-taking
      - iii. Note-taking
      - iv. Working in groups
      - v. Reading and learning from mathematics texts
      - vi. Class readiness and participation
    - b. Self-assessment skills
      - i. Using performance criteria to judge and improve one's own work
      - ii. Analyzing and correcting errors on homework and tests
    - c. Use of Resources
      - i. Peer study groups
      - ii. Tutoring services
      - iii. Computer resources
      - iv. Counseling resources
  - 5. Additional topics may be included at the instructor's discretion
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## Textbooks/Resources

### Other

1. Class activities and materials compiled by Palomar Mathematics Department faculty.
  2. Computer software and/or a graphing calculator may be required (e.g. Tinkerplots, Excel, MyMathLab)
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## Assignments

### Required Reading:

Additional readings as assigned by the instructor.

### Required Writing:

May include (but are not limited to) problem-solving exercises, homework, quizzes, tests, and projects.

### Critical Thinking:

Assignments must require students to apply critical thinking and quantitative reasoning skills to problem-solving and related areas of endeavor.

### Outside Assignments:

Outside assignments may include (but are not limited to) problem sets, projects, written assignments, review of

class materials, and reading the text.

Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments, prorated for short-term classes.

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## Methods of Assessment

Methods of Assessment may include, but are not limited to, the following:

1. Class Participation
  2. Class Work
  3. Demonstration
  4. Exams/Tests
  5. Group Projects
  6. Homework
  7. Journals
  8. Lab Activities
  9. Oral Presentation
  10. Papers
  11. Portfolios
  12. Projects
  13. Quizzes
  14. Research Projects
  15. Simulation
  16. Skills Test
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## Open Entry/Open Exit

No course is not offered as open entry/open exit

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## Repeatability

Course is Repeatable for Reasons other than a Deficient Grade? No

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## Contact Person

Tracy Johnston

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# PALOMAR COLLEGE TUTORING SERVICES SCHEDULE



CAMPUS	CENTER NAME	SERVICES	LOCATION EXTENSION	TUTORING DAYS & TIMES	APPOINTMENT OR WALK-IN	WHO CAN GO?
Escondido	Teaching & Learning Center (Escondido)	English, Writing, ESL, Math and Spanish	ESC-500 x8171	M-Th 9:30am-7pm F 10am-3:30pm	Walk-in only	All enrolled Palomar students
Fallbrook	Teaching & Learning Center (Fallbrook)	English, Writing, ESL, Math and Spanish	FC-K01 x8689	Vary, please call	Walk-in Only	All enrolled Palomar students
Rancho Bernardo	Teaching & Learning Center (Rancho Bernardo)	English, Writing, Math, Biology and Chemistry	RB-401 x8563	M-Th 9:30am-6pm	Walk-in Only	All enrolled Palomar students
San Marcos	Business Lab	Some Business and Accounting courses (see website for list of courses)	MD-335 x2496	M-Th 8am-5pm F 8am-12pm	Walk-in only	Students enrolled in a Business or Accounting class
San Marcos	CSIT Department	CSIT courses (CSCI, CSIT, CSNT, CSWB)	MD-233 x8181	Vary, please call x8181 or visit <a href="http://csit.palomar.edu">csit.palomar.edu</a>	Walk-in only	STEM students (emphasis CSIT dept courses)
San Marcos	ESL (English as a Second Language) Tutoring Center	Grammar, Writing, Speech, etc.	H-222 x4482	M-Th 9am-7pm F 9am-6pm Sat 10am-1pm	Appointment and Walk-in	All enrolled Palomar students
San Marcos	Math Learning Center	Math	MC-1 x2718	M-Th 8am-8pm F 8am-2pm Sat 9am-12pm	Walk-in only	Students enrolled in a Math class
San Marcos	Reading Center	Reading, Vocabulary	H-114 x2568	M-Th 8am-7pm F 8am-3:30pm	Appointment and Walk-in	All enrolled Palomar students
San Marcos	Science Technology Engineering Mathematics (STEM) Center	Chemistry, Earth Science, Engineering, Life Science, Physics, some Math and other STEM Courses	NS-310 x2265	M-Th 8am-6pm F 9am-2pm	Walk-in only	All enrolled Palomar students
San Marcos	S.T.A.R. Tutoring Center	Multiple subjects	LRC-318 x2448	M-Th 9am-7pm F & Sat 9am-12pm	Walk-in and Appointment (EOPS, TRiO, Equity)	All enrolled Palomar students
San Marcos	Veterans Resource Center (VRC)	Math, Spanish	ST-52 x2827	Vary, please call x2173 or x2827	Appointment and Walk-in	All military affiliated students
San Marcos	World Languages Resource Center (WLRC)	World Languages	H-125 x2564	Vary, please call x2564 or x3737	Appointment and Walk-in	Students enrolled in a language class
San Marcos	Writing Center	English, Writing assignments for any Palomar course	H-102 x2778	M-Th 8am-5:30pm F 9am-2pm	Appointment and Walk-in	All enrolled Palomar students

Online and off-site (excluding Escondido, Fallbrook and Rancho Bernardo) classes have access to free online tutoring. For more information, log on to your Canvas dashboard. For the most current schedule, go to [www.palomar.edu/tutoringservices](http://www.palomar.edu/tutoringservices) or call 760-744-1150 followed by the center's extension. Summer hours will vary.



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