

**PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS**

**CALCULUS-BASED PROBABILITY & STATISTICS
MATH2050**

Class Hours: 2

Credit Hours: 3

Laboratory Hours: 2

Revised: Fall 2016

Catalog Course Description:

Descriptive statistics, including bivariate trends; time series; concepts of probability and probability distributions; binomial and normal distributions; linear correlation and regression; estimation and significance tests for means; contingency tables, chi-square tests for goodness of fit and independence. A computer laboratory component is required.

Prerequisites:

MATH 1830 or MATH 1910

Corequisites:

None

Textbook(s) and Other Course Materials:

Textbook:

Larose, *Discovering Statistics, 2e, 2015 Media Update with LaunchPad*. W. H. Freeman, 2015: ISBN-13: 978-1-319-03473-3

References:

Triola, Mario F. *Elementary Statistics*. 9th ed. Redwood City, CA: The Benjamin/Cummings Publishing Company, Inc., 2003.

Personal Equipment:

According to instructor preference, you are allowed to use a calculator with statistical functions, Excel software, or a combination of the two.

I. Week/Unit/Topic Basis:

Week Topic

1. Statistical applications in business and economics; data; data sources; descriptive statistics; statistical inference and probability; summarizing qualitative data. Chapters 1 and 2
2. Summarizing quantitative data; exploratory data analysis; cross-tabulations and scatter diagrams. Chapter 3

3. Measures of location; measures of variability; some uses of the mean and the standard deviation; exploratory data analysis; measures of the association between two variables; computing measures of location and dispersion for grouped data. Chapter 3
4. Experiments, the sample space, and counting rules. Chapter 4
5. Assigning probabilities to experimental outcomes; events and their probabilities; some basic relationships of probability; conditional probability; random variables. Chapter 4
6. Discrete probability distributions; expected value and variance; the binomial probability distribution; the uniform probability distribution. Chapter 5
7. The normal probability distribution; normal approximation of binomial distributions; simple random sampling; point estimation; introduction to sampling distributions. Chapter 6
8. Sampling distribution of the sample mean; sampling distribution of the sample proportion; properties of point estimators; other sampling methods. Chapter 6
9. Interval estimation of a population proportion and estimation of a population mean, standard deviation known and unknown; determining sample size. Chapter 7
10. Developing null and alternative hypothesis; type I and type II errors; Tests about a population mean and proportion. Chapter 8
11. Tests about differences between the means of two populations, independent samples and matched samples. Tests about the differences in proportions. Chapter 9
12. Hypothesis tests about population variances and two population variances; Chapter 9
Goodness of fit test for multinomial populations; test of independence using contingency table. Chapter 11
13. The simple linear regression model; the least squares method. Chapter 10
14. Chapter Test and/or review for Final Exam
15. Final Exam Period

II. Course Goals*:

- A. Demonstrate descriptive methods of statistics, including frequency distribution, measures of central tendency, and measures of variation. VI.1-5
- B. Examine bivariate data, cross-tabulations, sorting, graphics, and covariance and correlation. VI.1-5
- C. Investigate probabilistic concepts. VI.1-5
- D. Explore sampling and sampling distributions. VI.1-5
- E. Master hypothesis testing. VI.1-5
- F. Determine and interpret correlation and regression analysis. VI.1-5
- G. Perform time series analysis. VI.1-5
- H. Apply the most common probability distributions. VI.1-5

*Roman numerals after course objectives reference the general education goals.

III. Expected Student Learning Outcomes*:

Student will be able to:

1. Construct frequency distributions and frequency histograms. A, D
2. Calculate measures of central tendency. A
3. Calculate measures of dispersion. A
4. Construct scatter diagrams. B
5. Calculate correlation coefficients and establish the relative strength of the linear relationships between two variables. B, D, F

6. Construct time series charts and interpret the results. G
7. Calculate probabilities using both the classical and the empirical approaches. C
8. Calculate probabilities based on both the standardized and non-standard normal distributions. D, H
9. Perform hypothesis tests, including, but not restricted to, means testing (both large and small samples), and tests of independence and goodness of fit. D, E, H

*Capital letters after Expected Student Learning Outcomes reference the course goals listed above.

VI. Evaluation:

A. Testing Procedures:

Students are evaluated on the basis of tests, and at the teacher's discretion, quizzes, homework, computer projects, and case studies. A minimum of four major unit tests and a comprehensive departmental final will be given. All tests will be administered during scheduled lab times.

B. Laboratory Expectations:

At least half of all class meetings take place in the mathematics department computer lab. A minimum of ten of these sessions will involve assignments to be turned in and graded, with the lab average making up a minimum of ten percent of the course grade.

C. Field Work: None

D. Other Evaluation Methods: None

E. Off-campus evaluation processes, standardized testing, computer applications, etc.

F. Grading Scale:

93 – 100	A
88 - 92	B+
83 - 87	B
78 - 82	C+
70 - 77	C
60 - 69	D
Below 60	F

V. Policies:

A. Attendance Policy:

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of Academic Affairs, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of Academic Affairs.

B. Academic Dishonesty:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

- Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
- Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.
- Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one's own work.
- Taking an exam for another student.
- Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
- Any of the above occurring within the Web or distance learning environment.

Please see the Pellissippi State Policies and Procedures Manual, Policy 04:02:00 Academic/Classroom Conduct and Disciplinary Sanctions for the complete policy.

C. Accommodations for disabilities:

Students that need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Disability Services (DS) in order to receive accommodations in this course. [Disability Services](http://www.pstcc.edu/sswd/) (<http://www.pstcc.edu/sswd/>) may be contacted via [email](#) or by visiting Alexander 130.

D. Other Policies:

Make-up Work: Instructor discretion about make-up tests and/or assignments.

Cell Phones: Cell phones are to be either turned off or put on vibration mode while in class. Instructor discretion as to penalty.