COLLIN COUNTY COMMUNITY COLLEGE
COURSE SYLLABUS

COURSE NUMBER: Math 1342
COURSE TITLE: Elementary Statistical Methods

CREDIT HOURS: 3   **LECTURE HOURS:** 3   **LAB HOURS:** 1

ASSESSMENTS: Prior to enrolling in this course, the student must demonstrate eligibility to enroll in the following: MATH 1314, MATH 1324, MATH 1342, or higher.

PREREQUISITE: TSI placement
COREQUISITE: None

COURSE DESCRIPTION: Collection, analysis, presentation and interpretation of data, and probability. Analysis includes descriptive statistics, correlation and regression, confidence intervals and hypothesis testing. Use of appropriate technology is recommended. Lab required and is part of the 3 hour class.

COLLEGE REPEAT POLICY: Texas residents attempting a course more than twice at Collin College are subject to regular tuition plus an additional $50 per semester credit hour. Undergraduate courses attempted at Collin College with a graded status of A, B, C, D, F, I, W (withdrawals after census), and AU (Audit) will be evaluated for repeat limits.

TEXTBOOK: Onsite and Online courses**:** Statistics – Informed Decisions Using Data, Sullivan, Michael III, 5th Edition, Pearson Education, 2017. ISBN13: 9780134136783

SUPPLIES: TI 83 or TI 84 graphing calculator is required, StatCrunch may also be used.

STUDENT LEARNING OUTCOMES:
Upon completion of this course the students should be able to do the following:
1. Explain the use of data collection and statistics as tools to reach reasonable conclusions.
2. Recognize, examine and interpret the basic principles of describing and presenting data.
3. Compute and interpret empirical and theoretical probabilities using the rules of probabilities and combinatorics. (Empirical and Quantitative)
4. Explain the role of probability in statistics.
5. Examine, analyze and compare various sampling distributions for both discrete and continuous random variables.
6. Describe and compute confidence intervals.
7. Solve linear regression and correlation problems. (Communication)
8. Perform hypothesis testing using statistical methods. (Critical Thinking)

COURSE REQUIREMENTS: Attending lectures and completing required lab exercises using a graphing calculator or a computer, completing assignments, and taking exams.
COURSE FORMAT: Lecture, lab, and guided practice.

METHOD OF EVALUATION: A minimum of four written exams, a lab component grade, and a comprehensive final exam will be given. Homework and/or quizzes may be used in place of one exam or in addition to exams. The weight of each of these evaluations will be specified in the individual instructor's addendum to this syllabus. All out-of-class course credit, including take-home exams, home assignments, service-learning, etc. may not exceed 25% of the total course grade; thus, at least 75% of a student's grade must consist of exams given in the class or testing center, and no student may retake any of these exams. The final exam must count for at least as much as each regular exam.

ATTENDANCE POLICY: Attendance is expected of all students. If a student is unable to attend, it is his/her responsibility to contact the instructor to obtain assignments. Please see the schedule of classes for the last day to withdraw from the course with a grade of W.

RELIGIOUS HOLY DAYS: In accordance with section 51.911 of the Texas Education Code, the college will allow a student who is absent from class for the observance of a religious holy day to take an examination or complete an assignment scheduled for that day within a reasonable time. A copy of the state rules and procedures regarding holy days and the form for notification of absence from each class under this provision are available from the Admissions and Records Office. Please refer to the current *Collin Student Handbook*.

ADA STATEMENT: It is the policy of Collin County Community College to provide reasonable and appropriate accommodations for individuals with documented disabilities. This College will adhere to all applicable federal and state laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to contact the ACCESS Office, SCC-D140 or 972.881.5898, (V/TDD 972.881.5950) in a timely manner to arrange for appropriate accommodations.

ACADEMIC ETHICS: Every member of the Collin College community is expected to maintain the highest standards of academic integrity. Collin College may initiate disciplinary proceedings against a student accused of scholastic dishonesty. Scholastic dishonesty includes, but is not limited to, statements, acts, or omissions related to applications for enrollment or the award of a degree, and/or the submission of one's own work material that is not one's own. Scholastic dishonesty may involve, but is not limited to, one or more of the following acts: cheating, plagiarism, collusion, use of annotated texts or teacher's editions, use of information about exams posted on the Internet or electronic medium, and/or falsifying academic records. While specific examples are listed below, this is not an exhaustive list and scholastic dishonesty may encompass other conduct, including any conduct through electronic or computerized means:

Plagiarism is the use of an author's words or ideas as if they were one's own without giving credit to the source, including, but not limited to, failure to acknowledge a direct quotation.

Cheating is the willful giving or receiving of information in an unauthorized manner during an examination; collaborating with another student during an examination without authority; using, buying, selling, soliciting, stealing, or otherwise obtaining course assignments and/or examination questions in advance, copying computer or Internet files, using someone else's work for assignments as if it were one's own; or any other dishonest means of attempting to fulfill the requirements of a course.

Collusion is intentionally or unintentionally aiding or attempting to aid another in an act of scholastic dishonesty, including but not limited to, failing to secure academic work; providing a paper or project to another student; providing an inappropriate level of assistance; communicating answers to a classmate about an examination or any

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other course assignment; removing tests or answer sheets from a test site, and allowing a classmate to copy answers. **See the current Collin Student Handbook for additional information.**

Contact the Dean of Students for the student disciplinary process and procedures or consult the *Collin Student Handbook*.

COURSE CONTENT: Proofs and derivations will be assigned at the discretion of the instructor. The student will be responsible for knowing all definition and statements of theorems for each section outlined in the following modules.

The student will be able to do all of the following:

(1) Introduction and Descriptive Statistics
1. Give examples of the beneficial uses of statistics and common ways statistics is used to deceive.
2. Arrange data in different ways and determine 4 levels of measurement.
3. Given a sampling situation identify the type of sampling used.
4. Construct a frequency table from given data.
5. Construct and analyze histograms, stem and leaf plots, and boxplots.
6. Compute, interpret and determine appropriate uses for measures of central tendency and variation.
7. Calculate weighted averages.
8. Use the measures of central tendency to identify possible shapes of distributions.
9. Use the Empirical Rule to compute percentages.
10. Interpret measures of position including z-scores, percentiles, and quartiles.
11. Use measures of position to identify unusual values and outliers.
11. Use a graphing calculator and technology to obtain statistics and graphs.

(2) Probability
1. Find probabilities of simple events.
2. Name the sample space.
3. Compute probabilities using the addition rule.
4. Compute probabilities using the multiplication rule and the general multiplication rule.
5. Use the complement rule.
6. Calculate conditional probabilities with contingency tables.
7. Compute and interpret empirical and theoretical probabilities using the rules of probabilities and combinatorics.
8. Use probability to determine if an event is unusual.
9. Use a graphing calculator and technology to find various probabilities.

(3) Probability Distributions
1. Distinguish between discrete and continuous random variables.
2. Given a probability distribution find the mean and standard deviation.
3. Given a scenario, calculate and interpret the expected value.
4. Determine if an experiment is binomial.
5. Calculate probabilities related to the Binomial Distribution including at least and at most probabilities.
6. Given a Binomial distribution calculate the mean and standard deviation. Use these measures to determine if outcomes are unusual.
7. (Optional: Use the Poisson distribution to solve application problems.)
8. Use a graphing calculator and technology to calculate probabilities from different distributions.

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(4) Normal Probability Distributions

1. Determine probabilities using standard and non-standard normal distributions. Interpret these probabilities.
2. Determine z-scores and data values given a normal distribution probability.
3. Use the Central Limit Theorem to find probabilities concerning the distribution of sample means.
4. (Recommended: Use Central Limit Theorem to find probabilities concerning the distribution of sample proportions)
5. Determine normality by inspection of normal probability plot.
6. Use a graphing calculator and technology to solve problems related to the normal distribution.

(5) Estimates and Sample Sizes

1. Determine sample size necessary for a specific confidence interval.
2. Estimate the value of a population proportion by the point estimate and confidence interval.
3. Estimate the value of a population mean by the point estimate and confidence interval.
4. Interpret confidence intervals.
5. Use a graphing calculator and technology to calculate confidence intervals and sample sizes.

(6) Hypothesis Testing

1. Understand the concepts behind hypothesis testing.
2. Use hypothesis testing to test claims made about population proportions, and means using the P-value approach that is commonly used in research.
3. State real world conclusions to hypothesis tests using appropriate terminology.
4. Distinguish between statistical significance and practical significance.
5. Use a graphing calculator and technology when testing hypotheses.

(7) Tests Comparing Two Parameters

1. Use the P-value approach for hypothesis testing of claims about two dependent means, two independent means, and two independent proportions.
2. Report confidence intervals to assess the size and importance of a significant difference.
3. State real world conclusions to hypothesis tests using appropriate terminology.
4. Use a graphing calculator and technology when testing hypotheses about two populations.

(8) Correlation and Regression

1. Use the scatter diagram and linear correlation coefficient to determine whether a linear relationship exists between two variables.
2. Determine the regression line for bivariate data.
3. Test hypotheses about correlation coefficients.
4. Understand that correlated data may not have a causal relationship.
5. Determine the best prediction relative to correlation.
6. Use a graphing calculator and technology to test for linear correlations

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