MATH-1410: ELEMENTARY PROBABILITY AND STATISTICS I

Cuyahoga Community College

Viewing: MATH-1410 : Elementary Probability and Statistics I

Board of Trustees:
2016-03-31

Academic Term:
Spring 2019

Subject Code
MATH - Mathematics

Course Number:
1410

Title:
Elementary Probability and Statistics I

Catalog Description:
First of two-semester introductory sequence in probability and statistics. Intended for students majoring in liberal arts, business, sciences, engineering, and education. Includes study of descriptive statistics, elementary probability, probability distributions, normal distribution, binomial distribution, sampling concepts, sampling distribution of sample mean, estimation, and hypothesis testing.

Credit Hour(s):
3

Lecture Hour(s):
3

Lab Hour(s):
0

Other Hour(s):
0

Requisites

Prerequisite and Corequisite
MATH-0965 Intermediate Algebra or MATH-1240 Contemporary Mathematics, or sufficient score on Math Placement Test, or departmental approval: equivalent coursework.

Note: MATH-1200, 1250, or 1280 completed prior to Fall 2016 or MATH-1270 completed prior to Summer 2017 will also meet prerequisite requirements for this course.

I. ACADEMIC CREDIT

Academic Credit According to the Ohio Department of Higher Education, one (1) semester hour of college credit will be awarded for each lecture hour. Students will be expected to work on out-of-class assignments on a regular basis which, over the length of the course, would normally average two hours of out-of-class study for each hour of formal class activity. For laboratory hours, one (1) credit shall be awarded for a minimum of three laboratory hours in a standard week for which little or no out-of-class study is required since three hours will be in the lab (i.e. Laboratory 03 hours). Whereas, one (1) credit shall be awarded for a minimum of two laboratory hours in a standard week, if supplemented by out-of-class assignments which would normally average one hour of out-of class study preparing for or following up the laboratory experience (i.e. Laboratory 02 hours). Credit is also awarded for other hours such as directed practice, practicum, cooperative work experience, and field experience. The number of hours required to receive credit is listed under Other Hours on the syllabus. The number of credit hours for lecture, lab and other hours are listed at the beginning of the syllabus. Make sure you can prioritize your time accordingly. Proper planning, prioritization and dedication will enhance your success in this course.

The standard expectation for an online course is that you will spend 3 hours per week for each credit hour.
II. ACCESSIBILITY STATEMENT

If you need any special course adaptations or accommodations because of a documented disability, please notify your instructor within a reasonable length of time, preferably the first week of the term with formal notice of that need (i.e. an official letter from the Student Accessibility Services (SAS) office). Accommodations will not be made retroactively. For specific information pertaining to ADA accommodation, please contact your campus SAS office or visit online at http://www.tri-c.edu/accessprograms/. Blackboard accessibility information is available at http://access.blackboard.com.

Eastern (216) 987-2052 - Voice
Metropolitan (216) 987-4344 – Voice. (216) 987-4048 – TTY.
Western (216) 987-5079 – Voice. (216) 987-5117 – TTY.
Westshore (216) 987-3900 – Voice. (216) 987-4048 – TTY.
Brunswick (216) 987-5079 – Voice. (216) 987-5117 – TTY.
Off-Site (216) 987-5079 - Voice

III. ATTENDANCE TRACKING

Regular class attendance is expected. Tri-C is required by law to verify the enrollment of students who participate in federal Title IV student aid programs and/or who receive educational benefits through other funding sources. Eligibility for federal student financial aid is based in part on enrollment status.

Students who do not attend classes for the entire term are required to withdraw from the course(s). Additionally, students who withdraw from a course or stop attending class without officially withdrawing may be required to return all or a portion of their financial aid based on the date of last attendance. Students who do not attend the full session are responsible for withdrawing from the course(s).

Tri-C is responsible for identifying students who have not attended a course before financial aid funds can be applied to students’ accounts.

Therefore, attendance is recorded in the following ways:
• For in-person and blended-learning courses, students are required to attend the course by the 15th day of the semester (or equivalent for terms shorter than five weeks) to be considered attending. Students who have not met all attendance requirements for in-person and blended courses, as described herein, within the first two weeks or equivalent, will be considered not attending.
• For online courses, students are required to login at least two times per week and submit one assignment per week for the first two weeks of the semester, or equivalent to the 15th day of the term. Students who have not met all attendance requirements for online courses, as described herein, within the first two weeks or equivalent, will be considered not attending.

At the conclusion of the first two weeks of a semester or equivalent, instructors report any registered students who have “Never Attended” a course. Those students will be administratively withdrawn from that course. However, after the time period in the previous paragraphs, if a student stops attending a class or wants or needs to withdraw, for any reason, it is the student's responsibility to take action to withdraw from the course. Students must complete and submit the appropriate Tri-C form by the established withdrawal deadline.

Tri-C is required to ensure that students receive financial aid only for courses that they attend and complete. Students reported for not attending at least one of their registered courses will have all financial aid funds held until confirmation of attendance in registered courses has been verified. Students who fail to complete at least one course may be required to repay all or a portion of their federal financial aid funds and may be ineligible to receive future federal financial aid awards. Students who withdraw from classes prior to completing more than 60 percent of their enrolled class time may be subject to the required federal refund policy.

If illness or emergency should necessitate a brief absence from class, students should confer with instructors upon their return. Students having problems with coursework due to a prolonged absence should confer with the instructor or a counselor.

IV. LEARNING OUTCOMES ASSESSMENT

Occasionally, in addition to submitting assignments to their instructors for evaluation and a grade, students will also be asked to submit completed assignments, called ‘artifacts,’ for assessment of course and program outcomes and the College’s Essential Learning Outcomes (ELOs). The artifacts will be submitted in Blackboard or a similar technology. The level of mastery of the outcome demonstrated by the artifact DOES NOT affect the student’s grade or academic record in any way. However, some instructors require that students submit their artifact before receiving their final grade. Some artifacts will be randomly selected for assessment, which will help determine improvements and support needed to further student success. If you have any questions, please feel free to speak with your instructor or contact the Learning Outcomes Assessment office.

V. CONCEALED CARRY STATEMENT

College policy prohibits the possession of weapons on college property by students, faculty and staff, unless specifically approved in advance as a job-related requirement (i.e., Tri-C campus police officers) or, in accordance with Ohio law, secured in a parked vehicle in a designated parking area only by an individual in possession of a valid conceal carry permit.

As a Tri-C student, your behavior on campus must comply with the student code of conduct which is available on page 29 within the Tri-C student handbook, available at http://www.tri-c.edu/student-resources/documents/studenthandbook.pdf. You must also comply with the College’s Zero Tolerance for Violence on College Property available at http://www.tri-c.edu/policies-and-procedures/documents/3354-1-20-10-zero-tolerance-for-violence-policy.pdf.
Outcomes

Course Outcome(s):
Apply and construct various graphs and charts to represent different data types.

Objective(s):
1. Use data to find Frequency Distributions.
2. Find Bar Pie charts, Histograms Stem-and-Leaf plots to represent data.

Course Outcome(s):
Perform hypothesis tests to evaluate claims about a single population mean.

Objective(s):
1. Determine the appropriate hypothesis test based upon a dataset.

Course Outcome(s):
Perform hypothesis tests known unknown population standard deviations

Objective(s):
1. Use graphing calculators, Excel and Minitab to perform statistical analysis, construct charts and graphs to solve probability and statistics problems.
2. Use supplemental websites to solve a variety of probability and statistical problems.

Course Outcome(s):
Use a variety of technology, software packages and supplemental websites to solve probability and statistics problems.

Course Outcome(s):
Use these graphs to interpret data.

Objective(s):
1. Find measures of location, dispersion, position and shape.
2. Handle grouped data.
3. Find and interpret box plots.

Course Outcome(s):
Compute descriptive statistics used to describe data.

Objective(s):
1. Construct scatter plots to graphically represent variable relationships.
2. Find correlation and regression coefficients to determine their strength.
3. Use simple linear regression to find the line of best fit.
4. Recognize and interpret the difference between correlation and causation.

Course Outcome(s):
Compute correlation and regression coefficients to determine the relationship between two variables.

Objective(s):
1. Compute the marginal frequency of a variable.
2. Use the conditional distribution to identify association among categorical data.

Course Outcome(s):
Use contingency tables to establish association between two variables.

Objective(s):
1. Use Tree Venn diagrams to find probabilities.
2. Use of Counting rules.
3. Find and use contingency tables to find probabilities.
4. Find Conditional and marginal probabilities.

**Course Outcome(s):**
Apply elementary probability concepts to make decisions on events involving chance.

**Objective(s):**
1. Understand discrete random variables and find their distributions.
2. Find expected values.
3. Use a binomial random variable to find probabilities.

**Course Outcome(s):**
Apply concepts of discrete random variables and their distributions for decision-making.

**Objective(s):**
1. Identify properties of the normal random variable.
2. Find areas under the normal curve.
3. Find probabilities using z-scores and the normal approximation to the binomial.

**Course Outcome(s):**
Solve applied problems using concepts of continuous random variables and their distribution.

**Objective(s):**
1. Find point estimates for various population parameters.
2. Identify properties of the Central Limit Theorem and its applications.
3. Find and interpret interval estimates for different population parameters.
4. Find required sample sizes to carry out desired interval estimates.

**Course Outcome(s):**
Compute point estimates and interval estimates to make inferences about true populations.

**Objective(s):**
1. Identify and verify test assumptions.
2. Perform hypothesis tests using small large samples.

**Methods of Evaluation:**
1. Periodic exams.
2. Quizzes.
3. Homework.
4. In class collaborative work.
5. Projects employing technology and statistical software.
6. Comprehensive final exam.

**Course Content Outline:**
1. Descriptive statistics
   a. Frequency distribution
   b. Measure of location
   c. Measure of variation
   d. Handling grouped data
2. Relation between two variables
   a. Scatter plots
   b. Linear correlation coefficient
   c. Correlation versus causation
   d. Least squares regression line
   e. Marginal distribution
   f. Conditional distribution
3. Elementary probability
a. Tree diagram and counting techniques
b. Sample space and events
c. Some rules of probability
d. Conditional probability
e. Multiplicative property of a sequence of events

4. Probability distributions
   a. Random variable and its distribution
   b. Expected value of a random variable
   c. Mean and variance of a probability distribution
   d. Binomial distribution and its applications
   e. Normal distribution and its applications

5. Statistical inferences on population means
   a. Sampling techniques
   b. Sampling distribution and sampling concepts
   c. The central limit theorem
   d. Point and interval estimation on the mean
   e. Testing a hypothesis on the mean
   f. The t distribution and its application

6. Use of technology, software packages and websites
   a. Use graphing calculators and software packages for analysis
   b. How to interpret results
   c. Use of supplemental websites

Resources


Instructional Services

OAN Number:
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