Syllabus for STA-2010

PRINCIPLES OF STATISTICS

COURSE DESCRIPTION

Principles of Statistics is designed to meet the needs of students across multiple disciplines and professions. As data become more prevalent in our world through advances in technology, there is a growing need to understand, analyze, and utilize these data effectively to make decisions. This course provides students with techniques needed to scientifically analyze data for statistical interpretation. Topics include types of statistics, data representations (tables, graphs, and charts), measures of location and variation, probability concepts, continuous and discrete distributions, confidence intervals, hypothesis tests, distribution-free tests, and regression and correlation analysis. The emphasis of the course is on the application of these statistical methods to solve real-world problems regardless of academic or professional discipline.

COURSE TOPICS

- Sampling and data
- Descriptive statistics
- Probability
- Statistical distributions
- Hypothesis testing
- Distribution-free testing

COURSE OBJECTIVES

After completing this course, students should be able to:

CO 1 Describe basic principles of statistical design.

CO 2 Summarize data into tables and graphs.

CO 3 Calculate measures of central tendency and variation.

CO 4 Apply concepts of probability.

CO 5 Interpret statistical distributions.

CO 6 Apply appropriate procedures to test hypotheses.

CO 7 Interpret associations between variables.

COURSE MATERIALS

You will need the following materials to complete your coursework. Some course materials may be free, open source, or available from other providers. You can access free or open-source materials by clicking the links provided below or in the module details documents. To purchase course materials, please visit the University's textbook supplier.

Required Textbooks

- Illowsky, B., & Dean, S. (2019). *Introductory statistics*. Houston, TX: OpenStax.
  CC BY 4.0.
  View the book online.
- Lane, D. (2019). *Introductory statistics*. Libretexts.
  CC BY-NC-SA 3.0.
  View the book online.

COURSE STRUCTURE

Principles of Statistics is a three-credit, online course consisting of **six** modules, a midterm exam, and a final project. Modules include an overview, topics, learning objectives, study materials, and activities. Module titles are listed below.

- **Module 1: Introduction to Statistics**
  Course objectives covered in this module: CO 1, CO 2, CO 3

- **Module 2: Probability**
  Course objectives covered in this module: CO 2, CO 4, CO 5

- **Module 3: Normal Distributions**
  Course objectives covered in this module: CO 5

- **Module 4: Hypothesis Testing**
  Course objectives covered in this module: CO 6

- **Module 5: Distribution-Free Tests**
  Course objectives covered in this module: CO 6

- **Module 6: Measures of Association**
  Course objectives covered in this module: CO 7

ASSESSMENT METHODS

For your formal work in the course, you are required to participate in online discussion forums, complete written assignments and practice exercises, take module quizzes, take a proctored midterm examination, and complete a final project. See below for details.

Consult the Course Calendar for due dates.

Promoting Originality

One or more of your course activities may utilize a tool designed to promote original work and evaluate your submissions for plagiarism. More information about this tool is available in this document.

Discussion Forums

You are required to complete **seven** discussion forums. The discussion forums are on a variety of topics associated with the course modules. A grading rubric for the discussion forums can be found within the Evaluation Rubrics folder in Moodle.

Written Assignments

You are required to complete **six** written assignments. The written assignments are on a variety of topics associated with the course modules and are based on student data that is collected during the Introductions Forum in Week 1. You might find the following links helpful in formatting your written assignments:

- Microsoft. (n.d.). *Equation editor*.
- Microsoft. (n.d.). *Write an equation or formula*.

A grading rubric for each of the written assignments can be found within the Evaluation Rubrics folder in Moodle.

Practice Exercises

You are required to complete **six** practice exercises. The practice exercises are made up of a variety of questions related to the readings for the module. A list of questions for each of the practice exercises is linked within the module document. You might find the following links helpful in formatting your practice exercises:

- Microsoft. (n.d.). *Equation editor*.
- Microsoft. (n.d.). *Write an equation or formula*.

Quizzes

You are required to complete **six** quizzes. Each quiz will consist of multiple-choice questions. The module quizzes are on a variety of topics associated with the course modules. You may take these quizzes multiple times for additional practice; the result of your most recent attempt will appear in your gradebook.

Midterm Examination

You are required to take an online, proctored, **midterm exam**. The midterm covers material from Modules 1, 2, and 3 in the course and consists of 33 multiple-choice items with a 2-hour time limit. You are permitted to use a calculator (scientific, graphing, or financial), but you may *not* use a calculator on a phone, PDA, or any similar device.

A **practice midterm exam** is available in the Examinations section of the course space. The practice exam is ungraded, and you may take it as many times as you'd like for additional review. The practice exam contains questions that are similar to those on the graded exam, so it is an effective way of preparing for the exam. In the Examinations section of the course website, click on the Practice Final Exam link to begin.

Note: For a list of key concepts that may appear on your exam, refer to the study guide available in the Examinations section of the course website.

For the midterm, you are required to use the University's Online Proctor Service (OPS). Please refer to the "Examinations and Proctors" section of the Online Student Handbook (see Student Handbooks in the General Information area of the course website) for further information about scheduling and taking online exams and for all exam policies and procedures. You are strongly advised to schedule your exam within the first week of the semester.

Online exams are administered through the course website. Consult the Course Calendar for the official dates of exam weeks.

Statement about Cheating

You are on your honor not to cheat during the exam. Cheating means:

- Looking up any answer or part of an answer in an unauthorized textbook or on the Internet, or using any other source to find the answer.
- Copying and pasting or in any way copying responses or parts of responses from any other source into your online test. This includes but is not limited to copying and pasting from other documents or spreadsheets, whether written by yourself or anyone else.
- Plagiarizing answers.

- Asking anyone else to assist you by whatever means available while you take the exam.
- Copying any part of the exam to share with other students.
- Telling your mentor that you need another attempt at the exam because your connection to the Internet was interrupted when that is not true.

If there is evidence that you have cheated or plagiarized in your exam, the exam will be declared invalid, and you will fail the course.

📋 *Final Project*

You are required to complete a final project. For your final project, you will analyze the set of data provided in the Student Data Table in Week 1. You will develop two research questions from the data we collected that would require two different tests (parametric or nonparametric) covered in this class. Then, you will identify the variables needed to answer these questions, develop hypotheses, test for relationship, and use the statistics to answer the questions and hypotheses. You should:

1. NOT ask the same questions found in the written assignments.
2. NOT use the same variables in both questions/tests
3. INCLUDE one question/test that incorporates one categorical variable and one continuous variable
4. INCLUDE one question/test that incorporates either two categorical or two continuous variables

Note: You may convert/regroup a continuous variable into a categorical variable.

A grading rubric for the final project can be found within the Evaluation Rubrics folder in Moodle.

GRADING AND EVALUATION

Your grade in the course will be determined as follows:

- **Online discussions (7)—**14%
- **Written assignments (6)—**18%
- **Practice exercises (6)—**8%
- **Quizzes (6)—**10%
- **Midterm exam (proctored, Modules 1–3)—**20%
- **Final project—**30%

All activities will receive a numerical grade of 0–100. You will receive a score of 0 for any work not submitted. Your final grade in the course will be a letter grade. Letter grade equivalents for numerical grades are as follows:

A	= 93–100	C+	= 78–79
A–	= 90–92	C	= 73–77
B+	= 88–89	C–	= 70–72

B	=	83–87	D	=	60–69
B–	=	80–82	F	=	Below 60

To receive credit for the course, you must earn a letter grade of C or better (for an area of study course) or D or better (for a course not in your area of study), based on the weighted average of all assigned course work (e.g., exams, assignments, discussion postings).

STRATEGIES FOR SUCCESS

First Steps to Success

To succeed in this course, take the following first steps:

- Read the entire Syllabus carefully, making sure that all aspects of the course are clear to you and that you have all the materials required for the course.
- Take time to read the entire Online Student Handbook. The Handbook answers many questions about how to proceed through the course, how to schedule exams, and how to get the most from your educational experience at Thomas Edison State University.
- Arrange to take your examination by following the instructions in this Syllabus and the Online Student Handbook.
- Familiarize yourself with the learning management systems environment—how to navigate it and what the various course areas contain. If you know what to expect as you navigate the course, you can better pace yourself and complete the work on time.
- If you are not familiar with web-based learning, be sure to review the processes for posting responses online and submitting assignments before class begins.

Study Tips

Consider the following study tips for success:

- To stay on track throughout the course, begin each week by consulting the Course Calendar. The Course Calendar provides an overview of the course and indicates due dates for submitting assignments, posting discussions, and scheduling and taking examinations.
- Check Announcements regularly for new course information.

Using AI Ethically: A Guide for TESU Students

TESU's Academic Code of Conduct permits student AI use in support of their writing and research process--not as a replacement for original writing. Document AI use with an acknowledgment statement at the end of each assignment, noting the tools and prompts used. Cite any AI-generated content on the

References page. Please review Using AI Ethically: A Guide for TESU Students for more detailed information.

COMMITMENT TO DIVERSITY, EQUITY, AND INCLUSION

Thomas Edison State University recognizes, values, and relies upon the diversity of our community. We strive to provide equitable, inclusive learning experiences that embrace our students' backgrounds, identities, experiences, abilities, and expertise.

ACCESSIBILITY AND ACCOMMODATIONS

Thomas Edison State University adheres to the Americans with Disabilities Act (ADA, 1990; ADAAA, 2008) and Section 504 of the Rehabilitation Act of 1973. The Office of Student Accessibility Services (OSAS) oversees requests for academic accommodations related to disabilities; a student who is pregnant, postpartum, or a student parenting a newborn who is not the birth parent [as covered under NJSA18A]; and students requesting academic accommodation for a short-term/temporary illness and/or injury. Information can be found on the Office of Student Accessibility Services webpage and questions can be sent to ADA@tesu.edu.

ACADEMIC POLICIES

To ensure success in all your academic endeavors and coursework at Thomas Edison State University, familiarize yourself with all administrative and academic policies including those related to academic integrity, course late submissions, course extensions, and grading policies.

For more, see:

- University-wide policies
- Undergraduate academic policies
- Undergraduate course policies
- Graduate academic policies
- Graduate course policies
- Nursing student policies
- Nursing graduate student policies
- International student policies
- Academic code of conduct