

**MATH 2050 - Calculus-Based Probability and Statistics**  
**3 Credit Hours**

**Course Description:**

This course introduces probability and statistics covering data analysis, probability and statistical inference. The inference material covers means, proportions, and variances for one and two samples, one-way ANOVA, regression and correlation and chi-square analysis.

**Course Outcomes:**

Upon successful completion of this course, students will:

- Distinguish between descriptive and inferential statistics;
- Construct and graph a frequency distribution as a histogram, a frequency polygon and pie chart;
- Calculate measures of central tendency;
- Calculate measures of variance;
- Utilize the concepts of union and intersection in probability experiments, sample spaces, and events;
- Find the probability of an event;
- Apply properties of probabilities;
- Use counting techniques in probability;
- Apply properties of conditional probability and independent events;
- Utilize the properties of the binomial distribution;
- Find the z-score;
- Utilize the z-score when finding probabilities and continuous variables;
- Algebraically find the score when given a probability;
- Utilize the normal curve to approximate the binomial distribution
- Utilize the central limit theorem to find the probabilities and sample means;
- Test hypotheses about population parameters;
- Utilize the t-test when the normal curve is unsuitable;
- Construct and utilize confidence intervals;
- Calculate appropriate sample sizes for tests of proportions and means;
- Test hypotheses involving multinomial experiments and contingency tables;
- Utilize the Chi-Square distribution with studies involving variance and standard deviation;

- Compare two or more population means by parametric and nonparametric models;
- Determine the appropriate sample size to estimate the difference between a pair of means;
- Utilize the analysis of variance (ANOVA) to compare two or more populations;
- Compare two or more population proportions by parametric and nonparametric methods;
- determine the appropriate sample size required to compare two population proportions;
- Determine linear correlation by using parametric and nonparametric methods;
- Calculate coefficient of correlation and coefficient of determination;
- Interpret the y-intercept, slope and standard deviation of the linear regression model.

#### Prerequisites and Corequisites:

MATH 1830 or MATH 1910

#### Course Topics:

- Module 1: Descriptive Statistics
- Module 2: Probability Distributions
- Module 3: Confidence Intervals and Hypothesis Testing
- Module 4: Comparisons of Population Means and Proportions
- Module 5: Linear Regression

#### Specific Course Requirements:

The student should have basic familiarity with Microsoft Office components such as Word,

power point, and front page. Several word processing documents will be submitted throughout the course. The assignments should be submitted in Microsoft Word format. Although, there is no requirement to purchase Microsoft Word, students must discover a way to save documents in Word format.

### Required Textbooks:

Please visit the [Virtual Bookstore](#) to obtain textbook information for this course. Move your cursor over the "Books" link in the navigation bar and select "Textbooks & Course Materials." Select your Program, Term, Department, and Course; then select "Submit."

### Supplementary Materials:

Please visit the Virtual Bookstore for information concerning supplementary information for this course.

### Hardware and Software Requirements:

Minimum hardware requirements can be found [here](#).

Minimum software requirements can be found [here](#).

### **Common applications you might need:**

To read a PDF file download the latest version of [Adobe Reader here](#)

Don't have Microsoft Word? Explore an alternative [OpenOffice here](#)

Accessing a PowerPoint file? Download the [PowerPoint Viewer here](#)

### Web Resources:

Purdue [OWL Online Writing Lab](#) (for APA, MLA, or Chicago style)

The Writing Center [Online Writer's Handbook](#)

#### Student Resources:

- Technical support information can be found on the [TN eCampus Help Desk](#) page.
- Smarthinking virtual tutoring is available **FREE** of charge. to access Smarthinking, visit the course homepage and select Smarthinking under Course Resources. You also view [sample sessions](#) to see what Smarthinking offers and how it works.
- Information on other student issues or concerns can be located on the [TN eCampus Student Resources](#) page.

#### Instructor Information:

Please see "Instructor Information" in the Getting Started Module for instructor contact information, virtual office hours, and other communication information. You can expect to receive a response from the instructor within 24-48 hours unless notified of extenuating circumstances.

#### Testing Procedures:

Students will submit all exercises and take quizzes online through Desire2Learn (D2L).

#### Grading Procedures:

Each of the 5 units will include quizzes, assignments, a test, and a discussion posting reflecting on what you learned in the module. Assignments will count 20 points per module. The average of all unit quizzes will count 100 points. The average of all homework grades

taken in MyStatLab will count 100 points. Tests will count 100 points each. Class participation through discussion postings for each module will count 100 points. A final exam will count 200 points. The evaluation system is based on points. You may earn bonus or extra credit points along the way, but the required elements are based on the following point system:

5 Module Tests	500 points
Discussions	100 points
Quizzes	100 points
Homework Assignments worked in MyStat Lab	100 points
Assignments	100 points
Final Exam	200 points
Total Points Possible	1100 Points

#### Grading Scale:

990-1100 points	A
880-989 points	B
770-879 points	C
660-769 points	D
659 points or below	F

#### Assignments and Projects:

There will be ten assignments worth 10 points each.

Categorizing Data	10 points
Measures	10 points
Beginning Probability	10 points

Normal and Binomial Probability	10 points
Confidence Intervals	10 points
Hypothesis Testing	10 points
Wilcoxon Signed Rank Test	10 points
ANOVA	10 points
Regression Analysis	10 points
Spearman's Test for Rank Correlation	10 points

#### Class Participation:

Students are expected to participate in all interactive aspects of this course. Students must actively participate in threaded discussion events. You are expected to work at a pace conducive to collaborative learning - that is, don't work too far ahead or too far behind the group. The class is designed to support student interaction.

#### Late Policy:

Students are expected to participate in all interactive aspects of this course. Students must actively participate in threaded discussion events. You are expected to work at a pace conducive to collaborative learning - that is, don't work too far ahead or too far behind the group. The class is designed to support student interaction.

## Course Ground Rules:

*The following two statements (1., 2.) were derived from the TBR System-wide Student Rules document, released January 2012:*

### RULES OF THE TENNESSEE BOARD OF REGENTS STATE UNIVERSITY AND COMMUNITY COLLEGE SYSTEM OF TENNESSEE SYSTEMWIDE STUDENT RULES CHAPTER 0240-02-03 STUDENT CONDUCT AND DISCIPLINARY SANCTIONS

[Read the document in its entirety here.](#)

#### **1. Standards of Conduct:**

- Students are required to adhere to the same professional, legal and ethical standards of conduct online as on campus. In addition, students should conform to generally accepted standards of "netiquette" while sending e-mail, posting comments to the discussion board, and while participating in other means of communicating online. Specifically, students should refrain from inappropriate and/or offensive language, comments and actions.

#### **2. [Review the TN eCampus Academic Integrity/Academic Honesty Policy:](#)**

- In their academic activities, students are expected to maintain high standards of honesty and integrity. Academic dishonesty is prohibited.

Such conduct includes, but is not limited to:

- an attempt by one or more students to use unauthorized information in the taking of an exam
- to submit as one's own work, themes, reports, drawings, laboratory notes, computer programs, or other products prepared by another person,
- or to knowingly assist another student in obtaining or using unauthorized materials.

Plagiarism, cheating, and other forms of academic dishonesty are prohibited.

Students guilty of academic misconduct, either directly or indirectly through participation or assistance, are subject to disciplinary action through the regular procedures of the student's home institution. Refer to the student handbook provided by your home institution to review the student conduct policy.

In addition to other possible disciplinary sanctions that may be imposed, the instructor has the authority to assign an "F" or zero for an activity or to assign an "F" for the course.

## **Other Course Rules:**

Students are expected to:

- Participate in all aspects of the course
- Communicate with other students
- Learn how to navigate in Brightspace
- Keep abreast of course announcements
- Use the assigned course management (Brightspace) email address rather than a personal email address
- Address technical problems immediately:
  - [Contact Technical Support](#)
  - [View Term Calendar here](#)
- Observe course netiquette at all times.

## **Guidelines for Communications:**

### **Email:**

- Always include a subject line.
- Remember without facial expressions some comments may be taken the wrong way. Be careful in wording your emails. Use of emoticons might be helpful in some cases.
- Use standard fonts.
- Do not send large attachments without permission.
- Special formatting such as centering, audio messages, tables, html, etc. should be avoided unless necessary to complete an assignment or other communication.
- Respect the privacy of other class members

### **Discussions:**

- Review the discussion threads thoroughly before entering the discussion. Be a lurker then a discussant.
- Try to maintain threads by using the "Reply" button rather starting a new topic.
- Do not make insulting or inflammatory statements to other members of the discussion group. Be respectful of other's ideas.
- Be patient and read the comments of other group members thoroughly before entering your remarks.
- Be cooperative with group leaders in completing assigned tasks.
- Be positive and constructive in group discussions.
- Respond in a thoughtful and timely manner.

## Library:

The [Tennessee Virtual Library](#) is available to all students enrolled in TN eCampus programs and courses. Links to library materials (such as electronic journals, databases, interlibrary loans, digital reserves, dictionaries, encyclopedias, maps, and librarian support) and Internet resources needed by learners to complete online assignments and as background reading will be included within the course modules. To access the Virtual Library, go to the course homepage and select the **Virtual Library** link under Course Resources.

## Students with Disabilities:

Qualified students with disabilities will be provided reasonable and necessary academic accommodations if determined eligible by the appropriate disability services staff at their home institution. Prior to granting disability accommodations in this course, the instructor must receive written verification of a student's eligibility for specific accommodations from the disability services staff at the home institution. It is the student's responsibility to initiate contact with their home institution's disability services staff and to follow the established procedures for having the accommodation notice sent to the instructor.

## Syllabus Changes:

The instructor reserves the right to make changes as necessary to this syllabus. If changes are necessitated during the term of the course, the instructor will immediately notify students of such changes both by individual email communication and posting both notification and nature of change(s) on the course bulletin board.

## Disclaimer

The information contained in this syllabus is for general information purposes only. While we endeavor to keep this information up-to-date and accurate, there may be some discrepancies between this syllabus and the one found in your online course. The syllabus of record is the one found in your online course. Please make sure you read the syllabus in your course at the beginning of the semester. Questions regarding course content should be directed to your instructor.