Tompkins Cortland Community College
Master Course Syllabus

Course Discipline and Number: MATH 109   **Year: 2023-2024**
Course Title: Statistical Literacy   **Credit Hours: 3**

Attendance Policy: *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

Services for Students with Disabilities: *It is the College's policy to provide, on an individual basis, appropriate academic adjustments to students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for accommodations. All course materials are available in alternate formats upon request.*

Course Description

This course is a study of selected topics from basic probability and statistics, including equally likely outcomes, conditional probability, mutually exclusive events, independent events, multiplication rule, mean, median, mode, standard deviation, normal curve, margin of error, and expected value. It is intended as a math elective for students without a background in algebra and is not a substitute for a standard statistics course. Students are required to have a calculator capable of computing mean and standard deviation, TI-34II recommended. Cooperative work is encouraged. Math 109 fulfills the SUNY General Education Mathematics requirement. Prerequisites: C or better grade in MATH 090 if required by placement testing; RDNG 099 if required by placement testing; prior completion or concurrent enrollment in ENGL 099 or prior completion or concurrent enrollment in ESL 120, 121, and 122 (or prior completion of ESL 103) if required by placement testing. 3 Cr. (3 Lec.) Fall and spring semesters. Fall and spring semesters.

Course Context/Audience

The course satisfies the SUNY general education mathematics requirement. It is not a prerequisite for other MATH courses, and may not be accepted for transfer by some four-year colleges.

Basic Skills/Entry Level Expectations

Writing: W1   Student should be taking ENGL 099 or ESL 103 (if needed). The course requires very limited writing, e.g., short written responses of a paragraph or less.
Math: M2   Completed MATH 090 (if needed) - Course requires only the use of basic mathematical skills.
Reading: R2   Before taking this course, students must have a C or better in RDNG 099 or assessment indicating that RDNG 099 was not required.

Revised 01-17/D. Bethoney

Course Goals

By successfully completing this course, the student will:

1. Learn how to compute basic and conditional probabilities.
2. Learn how to compute mean, median, mode, and standard deviation for a given set of data.
3. Understand mutually exclusive events and independent events.
4. Learn how to compute expected value and margin of error.
5. Learn how to use the normal curve.

Course Objectives/Topics

Objective/Topic	# Hours
Compute basic probabilities associated with such everyday items as cards, coins, dice, and colored marbles. Also, compute probabilities using small spreadsheet data charts. If helpful, use multiplication rule of counting on cards and dice.	6 Hours
Compute, using an inexpensive statistics capable calculator, the mean and standard deviation of data presented in any of the following formats: ungrouped, grouped by actual scores, grouped in intervals. Without using a calculator, compute median and mode for ungrouped data or data grouped by actual scores.	8 Hours
Compute expected value, including being able to apply probabilities associated with cards, coins, and dice in expected value problems.	4 Hours
Compute margin of error on a proportion for the 95% confidence level.	2 Hours
Compute standard scores. Use these to compare raw scores, such as in curving an examination.	2 Hours
Use the normal curve, first abstractly, and finally in "real world" situations.	5 Hours
Study mutually exclusive events and the complement rule.	1 Hour
Study conditional probability in the context of cards, coins, and small spreadsheet charts.	4 Hours
Compute the probability of dependent events using the general multiplication rule.	3 Hours
Define independent events using conditional probability. Deduce the multiplication rule for independent events from the general multiplication rule. Use the multiplication rule for independent events to compute the probabilities associated with such events.	3 Hours
Learn how to test for independence using the multiplication rule.	3 Hours
Flex time. The instructor may do written reports, introduce game theory, or do more in-depth problems on selected topics.	2 Hours
Group work, projects.	2-3 Hours

General Education Goals - Critical Thinking & Social/Global Awareness

CRITICAL THINKING OUTCOMES	HOW DOES THE COURSE ADDRESS THE OUTCOMES (Include required or recommended instructional resources, strategies, learning activities, assignments, etc., that must or could be used to address the goal/outcomes)
Students will be able to ➢ develop meaningful questions to address problems or issues ➢ gather, interpret, and evaluate relevant sources of information ➢ reach informed conclusions and solutions ➢ consider analytically the viewpoints of self and others	This course is designed to address problem solving with material introduced. Homework and/or activities and tests Students will write and/or present information they gathered. Paper and/or oral presentation
SOCIAL/GLOBAL AWARENESS OUTCOMES	**HOW DOES THE COURSE ADDRESS THE OUTCOMES** (Include required or recommended instructional resources, strategies, learning activities, assignments, etc., that must or could be used to address the goal/outcomes)
➢ Students will begin to understand how their lives are shaped by the complex world in which they live. ➢ Students will understand that their actions have social, economic and environmental consequences	Not Addressed

Instructional Methods
In the traditional classroom, material may be introduced by lecture. Students may perform experiments in class, such as flipping coins and rolling dice, and then comparing their results with the theoretical predictions. Students may be assigned data gathering projects to be done outside of class. There should be frequent quizzes and/or collection of homework. Students should be encouraged to work together, even on quizzes, as one of the benefits of the course should be for students to become comfortable talking and reasoning about mathematics with others. The instructor should begin the course with basic probability, but can then continue with more probability, or switch to statistics and cover that material before completing probability.

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Methods of Assessment/Evaluation

Method	% Course Grade
Homework	10-20%
Quizzes	0-20%
Projects or In-Class Labs	0-15%
Participation/Attendance	0-10%
Exams	20-50%
Final Exam	15-25%

Text(s)

A Practical Introduction to Statistics, Khaki B. Wunderlich, Latest edition, Tompkins Cortland Community College
Required

Bibliography

No print resources specified

Other Learning Resources

Audiovisual
Video companion to accompany MATH 109
Electronic
No resources specified
Other
The instructor may select a reading from which the student is to gather statistics for an out of class project.