

# North Hennepin Community College

## MATH 2010: Probability and Statistics

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: \*.\*

Lab Hours/Week: \*.\*

OJT Hours/Week: \*.\*

Prerequisites:

This course requires the following prerequisite

MATH 1222 - Calculus II (Minimum grade: 1.67 GPA Equivalent)

Corequisites: None

MnTC Goals: Goal 04 - Mathematical/Logical Reasoning

This is a calculus-based first course in the study of probability and statistics. Topics include descriptive statistics, general probability theory, random variables, sampling distributions, estimation, and hypothesis testing. Additional topics may include two-sample inference, linear regression, analysis of categorical data, analysis of variance, and quality and reliability.

Prerequisite: Math 1222 with grade of "C" or better

**B. COURSE EFFECTIVE DATES:** 08/27/1997 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. See Course Description and Course Outcomes.

### D. LEARNING OUTCOMES (General)

1. Use descriptive statistics to compare or describe data (MnTC Goal 4: b; Goal 2: a, b, c); (NHCC ELO 1)
2. Read and/or create visual summaries of data (e.g., histograms, stem-and-leaf displays, box-and-whisker plots) (G4: b; G2: a); (NHCC ELO 1)
3. Identify, describe, and determine mean and standard deviation of discrete probability distributions with an emphasis on Binomial and Poisson Distributions (G4: a, b, d); (NHCC ELO 1)
4. Identify density functions and use methods from calculus to determine probabilities relating to density functions (G4: a, b, d; G2: a, d); (NHCC ELO 1)
5. Calculate mean and standard deviation of density functions using methods from calculus (G4: a, b, d; G2: a); (NHCC ELO 1)
6. Identify and describe continuous probability distributions with an emphasis on Normal Distributions (G4: a, b, d); (NHCC ELO 1)
7. Determine probabilities using Binomial and Normal Distributions (G4: a, b, d); (NHCC ELO 1)
8. Describe the Central Limit Theorem and use it to determine probabilities (G4: a, b, d; G2 a); (NHCC ELO 1)
9. Create and interpret confidence intervals of population means, proportions, and variances (G4: a, b, d; G2: a, b, c, d); (NHCC ELO 1)
10. Create, perform, and interpret hypothesis tests of population means, proportions, and variances (G4: a, b, d; G2: a, b, c, d); and (NHCC ELO 1).
11. Use linear regression to investigate correlation of paired data (G4: a, b, d; G2: a, b, c, d). (NHCC ELO 1).

## **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

### Goal 04 - Mathematical/Logical Reasoning

1. Illustrate historical and contemporary applications of mathematical/logical systems.
2. Clearly express mathematical/logical ideas in writing.
3. Explain what constitutes a valid mathematical/logical argument(proof).
4. Apply higher-order problem-solving and/or modeling strategies.

## **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

## **G. SPECIAL INFORMATION**

1. Knowledge of Human Cultures and the Physical and Natural World--Through study in the sciences, mathematics, social sciences, humanities, histories, languages, the arts, technology and professions.
2. Intellectual and Practical Skills--Including: Inquiry and analysis; Critical and creative thinking; Written and oral communication; Quantitative literacy; Information literacy; Teamwork and problem solving.