RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

MATH 111 Statistics II

I. Basic Course Information

A. Course Number and Title: MATH 111 Statistics II

B. New or Modified Course: Modified

C. Date of Proposal: Semester: Fall Year: 2025

D. Effective Term: Fall 2026

E. Sponsoring Department: Mathematics & Computer Science

F. Semester Credit Hours: 3

G. Weekly Contact Hours: 3 Lecture: 3
Laboratory: 0
Out of class student work per week: 6

H. ☐ Prerequisite (s): A grade of "C" or better in MATH 110 Statistics I
☐ Corequisite (s):

I. Additional Fees: None

II. Catalog Description

Prerequisite: A grade of "C" or better in MATH 110 Statistics I
This course is a continuation of Statistics I. Topics include description and analysis of bivariate data, regression and correlation, inferences in regression, chi-square procedures, inferences in two means and proportions, simple experimental design, analysis of variance, and optional non-parametric tests.

III. Statement of Course Need

A. This course serves as a continuation of Statistics I and offers those students who are interested in the subject more exposure to statistical inference.
B. This course does not have a lab.
C. This course generally transfers as a mathematics general education requirement and a mathematics program elective dependent on the transfer institution.

IV. Place of Course in College Curriculum

A. This course serves as a free elective.
B. This course serves as a General Education course in Mathematics.
C. This course meets a program requirement for various A.S. and A.A. degree programs.
D. To see course transferability: a) for New Jersey schools, go to the NJ Transfer website, www.njtransfer.org; b) for all other colleges and universities, go to the individual websites.

V. Outline of Course Content

A. Statistics Inference
   1. Nature and Design of Hypothesis Tests – classical and modern
   2. Interpretation of Results
   3. Type I and Type II Errors
   4. Power Analysis
   5. *p*-values

B. Inferences About Two Population Means
   1. Independent and Dependent Samples
   2. Tests for Differences between Two Means
   3. Tests for Differences between Two Proportions
   4. Tests for Standard Deviations
   5. Chi-Square Procedures

C. Inferences About More Than Two Population Means
   1. The *F*-Distribution
   2. The Logic behind Analysis of Variance
   3. One-Way ANOVA
   4. Two-Way ANOVA

D. Descriptive Measures for Bivariate Data
   1. Scatter Plots
   2. Linear Equations with One Independent Variable
   3. The Regression Equation
   4. The Correlation Coefficient
   5. The Coefficient of Determination

E. Inferences for Regression and Correlation
   1. Standard Error of the Estimate
   2. Inferences for Regression and Correlation Coefficients
   3. The Model for Multiple Regression

F. Non-Parametric Tests (optional)

VI. A. Course Learning Outcomes:

At the completion of this course, students will be able to:

1. Choose an appropriate method of inferential statistics. (GE-2)
2. Conduct and interpret methods of inferential statistics for difference of two means or two proportions. (GE-2)
3. Conduct and interpret Chi-square tests for goodness of fit, independence or homogeneity. (GE-2)
4. Conduct and interpret one-way ANOVA and two-way ANOVA. (GE-2)
5. Conduct and interpret methods of statistical inference for linear regression including prediction intervals, confidence intervals and slope parameter. (GE-2)

B. Assessment Instruments

1. Teacher-written tests
2. Computer/calculator lab projects
3. Semester projects
4. Final examination
5. In-class quizzes

VII. Grade Determinants

A. Tests (required)
B. Quizzes
C. Homework (required)
D. Projects
E. Labs
F. Cumulative final exam (required)

VIII. Texts and Materials

A. Suggested textbook: *Statistics: Informed Decisions Using Data* by Sullivan
B. Computer-based sources: The instructor is free to choose the type of technology. Choices include but are not limited to:
    1. R
    2. MINITAB
    3. Excel/Google Sheets
    4. StatCrunch
    5. Scientific calculator with statistical capabilities

Please Note: The course outline is intended only as a guide to course content and resources. Do not purchase textbooks based on this outline. The RVCC Bookstore is the sole resource for the most up-to-date information about textbooks.

IX. Resources

Because of the technology used in the course, classes should be held in a computer laboratory.

X. Check One: ☐ Honors Course ☐ Honors Options ☒ N/A