I. Basic Course Information

A. Course Number and Title: MATH 111H Statistics II Honors

B. New or Modified Course: New

C. Date of Proposal: Fall 2014

D. Effective Term: Spring 2015

E. Sponsoring Department: Mathematics

F. Semester Credit Hours: 4

G. Weekly Contact Hours: 4
   Lecture: 4
   Laboratory: 0

H. Prerequisites/Corequisites: MATH 110 Statistics I or AP Statistics Score of 3 or above

I. Laboratory Fees: None

J. Name and Telephone Number or E-Mail Address of Department Chair: Rosemarie Gorini (908)526-1200 extension 8546, rgorini@raritaval.edu

II. Catalog Description

Prerequisite: 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.

Enrollment History:
In the fall 2014 semester we have 14 sections of Statistics 1 (Two of them online). Students completing Statistics 1 can take Statistics 2. Some colleges only transfer Statistics provided that the students complete both Statistics 1 and Statistics 2.

Value for Students:
Students will benefit from an honors Statistics course because it will give them an opportunity to study more deeply the research and inference methods which are being used in industry and education.

B. There is no laboratory component
C. This course will generally transfer as a mathematics course and a free elective.

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; for all other colleges and universities, go to the individual websites.

V. Outline of Course Content

A. Statistical 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. Blocking Designs (One Replication per cell, no interactions)
5. Two Factor Factorial Design (with Cell Replications and interactions)
6. Multiple Comparisons for Factorial Designs

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
6. Multiple Regression Model
7. The Multiple Correlation Coefficient, Multicollinearity
8. Model Selection and Partial Correlations
9. Categorical Variable Regression, Coding

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

F. Non-Parametric Tests (optional)

VI. Educational Goals and Outcomes

A. General Education Learning Outcomes:

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

1. Conduct an appropriate hypothesis test using both classical and modern (p-value) procedures. (GE-NJ 2)
2. Interpret results from inferential statistics to interpret data for the purposes of decision-making for comparing two population means. (GE-NJ 2)
3. Interpret results from inferential statistics to interpret data for the purposes of decision-making for comparing one or two population proportions. (GE-NJ 2)
4. Interpret results from inferential statistics to interpret data for the purposes of decision-making in Chi-Square tests for independence or goodness-of fit. (GE-NJ 2)
5. Interpret results from inferential statistics to interpret data for the purposes of decision-making for a one-way ANOVA analysis. (GE-NJ 2)
6. Use linear regression techniques for purposes of analysis and prediction for slope or correlation. (GE-NJ 2)
7. Use Multiple Regression techniques for purposes of analysis and prediction (*)
8. Use Factorial and Blocking designs to analyze data involving multiple factors. (*)

(* Embedded critical thinking)

B. Course Learning Outcomes:

See above

C. Assessment Instruments

A. Homework
B. Weekly quizzes
C. Tests
D. Projects
E. Computer Outputs
F. Cumulative Final Examination

VII. Grade Determinants

G. Homework
H. Weekly quizzes
I. Tests
J. Projects
K. Computer Outputs
L. Cumulative Final Examination
M. Individual teacher determinant

Primary formats, modes and method for teaching and learning that may be used in the course.
A. Lecture  
B. Small Groups  
C. Homework  
D. Weekly quizzes  
E. Tests  
F. Projects

VIII. Texts and Materials  
C. Computer-based sources: The instructor is free to choose the type of technology. Choices include but are not limited to:  
1. MINITAB  
2. SAS

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 CATT room where the instructor can access both MINITAB and the web. MINITAB software needs to be available in S020, the open lab, and any other computer lab where students may be working.