ROCHESTER COMMUNITY AND TECHNICAL COLLEGE — COMMON COURSE OUTLINE

Course discipline/number/title: MATH 0990: Statway Statistics I

A.   CATALOG DESCRIPTION
   1. Credits: 4
   2. Hours/Week: 4
   3. Prerequisites (Course discipline/number): MATH 0093
   4. MnTC Goals (if any): NA

B.   COURSE DESCRIPTION: This is the first course of a two-semester series of courses for students. Concepts and methods of statistics with an emphasis on data analysis will be presented. Developmental mathematics concepts that serve as a foundation for statistical analysis are integrated into the course. Included in the series are: methods for collecting data, graphical and numerical descriptive statistics, correlation, liner regression, basic concepts of probability, confidence intervals and hypothesis tests for means and proportions, and chi-square tests. These courses are expected to be completed in consecutive semesters. Reading skills as demonstrated by completion of READ 0800 or equivalent placement score.

C.   DATE LAST REVISED (Month, year): February, 2021

D.   OUTLINE OF MAJOR CONTENT AREAS:
   1. The statistical analysis process
   2. Graphical and numerical summaries of data
   3. Scatterplots, correlation, and regression
   4. Linear and non-linear models
   5. Two-way tables and probabilities
   6. Discrete and continuous probability distributions

E.   LEARNING OUTCOMES (GENERAL): The student will be able to:
   1. Distinguish between observational studies and experiments, and random, simple random, and other types of sampling procedures.
   2. Identify different sources of bias in sampling and devise different methods of random assignment for experiments.
   3. Compute the mean, median, mode, standard deviation, inter-quartile range, z-score and percentile rank of data.
   4. Construct and interpret histograms and dotplots for quantitative data.
   5. Interpret direction and strength of relationships of bivariate data from scatterplots and correlation coefficient.
   6. Compute the least squares regression line and use it to make predictions, interpret the meaning of the slope and intercept of the regression line, and compute and interpret the residuals to decide on appropriateness of the regression line model.
   7. Use exponential regression to fit certain non-linear data.
   8. Calculate and interpret marginal, joint, and conditional probabilities from the construction of two-way tables.
   9. Use the various definitions and interpretations of probability and the laws of probability to solve problems.
   10. Use theoretical discrete and continuous probability distributions to calculate probabilities, including using z-scores to calculate probabilities for a normal distribution.

F.   LEARNING OUTCOMES (MNTC): NA

G.   METHODS FOR EVALUATION OF STUDENT LEARNING: Methods may include but are not limited to:
   1. Homework
   2. Quizzes
   3. Examinations
   4. Computer laboratory Assignments
   5. Group or Individual Projects
   6. Comprehensive Final Exam

H.   RCTC CORE OUTCOME(S). This course contributes to meeting the following RCTC Core Outcome(s): Critical Thinking. Students will think systematically and explore information thoroughly before accepting or formulating a position or conclusion.

I.   SPECIAL INFORMATION (if any):
   1. Students must have, either personal or RCTC facility, access to a computer for laboratory assignments.