Department: Mathematics
Course Name: College Math Prep

Course Description:
This problem-based, inquiry-oriented, technology-rich, senior year mathematics course is intended for college-bound students whose intended program of study does not require calculus. Topics of study include: Interpreting Categorical Data, Counting Methods, Mathematics of Financial Decision-Making, Finances in the Real World, Binomial Distributions and Statistical Inference, Mathematics of Democratic Decision-Making, and review of some Algebra and Geometry Skills. We place an emphasis on critical thinking, complex communication, collaboration, creativity, and risk taking.

Content:
Algebra and functions
Functions modeling change
Mathematics of financial decision-making
Statistics and probability
Interpreting categorical data
Counting methods
Binomial distributions and statistical inference
Discrete mathematics
Geometry

Skills:
Develop understanding of two-way frequency tables and graphical representations (pie charts, stacked bar graphs frequency and percentage, grouped bar graphs)
Understand conditional probability and independence
Compare proportions including absolute risk reduction and relative risk
Understand characteristics and terminology of well-designed experiments
Compare two treatments by using data from a randomized experiment
Compute and understand expected frequency
Perform a Chi-Squared Test of Homogeneity
Understand Statistical Significance
Extend understanding of linear, exponential, quadratic, power, circular, and logarithmic functions to model quantitative relationships and data patterns whose graphs are transformations of basic patterns
Understand mathematical modeling: translation, reflection, stretching, and compressing graphs with connections to symbolic forms of corresponding function rules
Extend ability to count systematically and solve enumeration problems using permutations and combinations
Correctly use systematic listing and counting, counting trees, Multiplication Principles of Counting, Addition Principle of Counting, and selections with repetition
Understand the Binomial Theorem, combinatorial reasoning, and the general multiplication rule for probability
Use Pascal's Triangle for counting method problems
Extend the use of linear, exponential, and logarithmic functions, expressions, and equations in representing and reasoning about quantitative relationships involving financial mathematical models
Uses forms of investment, simple and compound interest, and future value of an increasing annuity
Compares investment options
Understand continuous compounding and natural logarithms, amortization of loans and mortgages, and

present value of a decreasing annuity
Can compare auto loan and leasing options
Understand banking and saving options
Resumes, Jobs, and taxes in order to create a budget
Develop an understanding of the rules of probability, binomial distributions, expected value, testing a model, simulation, making inferences about population based on random sample
Understand variability in sampling and sample error, margin of error, and confidence intervals
Comparisons of sample surveys, experiments, and observational studies and how randomization relates to each
Understands basic rules and vocabulary of probability, independent events, and mutually exclusive
Recognize and design sample surveys including random sampling and stratified random sampling
Understand response bias, sample selection bias, and sampling distribution

Text and Materials: (used as a reference)
Transition to College Mathematics and Statistics McGraw Hill

Methods of Instruction:
Class discussion
Group investigation
Individual tasks

Methods of Evaluation:
Projects
Tests
Quizzes
Classwork
Homework
Budget Challenge (when available) – computer based
Informal questioning
Observation