MAT141: College Math, Standard

Description: General Mathematics including personal finance, set theory, exponential growth and decay, probability and statistics. **Prerequisite:** MAT087 and RDG100

Learning Outcomes	Sample Problems
1. (Application level.) Utilize calculators (scientific or graphing) and available software to model, investigate, solve and justify solutions to given problems. (CSLO 1)	Determine which model best describes the ordered pairs. (0,1), (1,4), (2, 16), (3,81) a) Determine the model algebraically. b) Determine the model using regression.
2. (Analysis level) Given a description of a set, express the set in set-builder notation; and given two or more sets, evaluate the union and intersection of the two sets and represent the sets, union and intersection in a Venn Diagram. (CSLO 3)	For the following sets A = {1,2,3,4,5,6}, B = {2,4,5,7}, and U = {1,2,3,4,5,6,7,8,9} find: a) The union of A and B b) The intersection of A and B c) The complement of A d) Draw a Venn diagram to represent the sets. Set A is the set of Natural numbers greater than 5 and less than or equal to 19. Express the set in set builder notation.
3. (Application level) Apply the concepts of counting, factorials, permutations, and combinations to calculate solutions to problems (CSLO 1,4)	How many ways can we pick a three person committee from our class of 15 people? In how many ways can we form a batting lineup for our team of 11 people? How many distinct meals can be chosen from 5 entrees, 3 appetizers and 4 desserts?
4. (Application level) Use geometric figures (circle, square, rectangle, triangle) to model problems and apply the appropriate formula of measurement to find the missing quantity. (CSLO 3)	Find the circumference and area for a circle with radius equal to 4cm (include units in your answer). Find the missing leg on the right triangle with one leg equal to 14 and hypotenuse equal to 22. Round to the nearest tenth.
5. (Application level) Calculate the odds of a specified event, apply the rules of probability to solve for the probability of a specified event, determine the dependent/independent events and determine the expected value of an event. (CSLO 1,2,4)	You randomly select one card from a 52-card deck. a) Find the probability of selecting a five or a six. b) Find the probability of selecting a nine or a spade. c) Find the probability of selecting a 5 given that a heart is selected. An architect is considering bidding for the design of a new museum. The cost of drawing plans and submitting a model is $10,000. The probability of being awarded the bid is .1. If the architect is awarded the bid, she will make $100,000 minus the cost of the

	bid. What is the expected value of the situation? What does this mean?
6. (Comprehension level) Given a set of data, evaluate the mean, median, mode, range, variance and standard deviation and calculate z-scores of a normal data set to solve problems. (CSLO 1,2,4)	Scores on the GRE are normally distributed with a mean of 507 and a standard deviation of 137. Use the 68-95-99.7 Rule to find the percentage of people taking the test who scored between 233 and 781. Find the percentage of people that scored above 644. Find the mean and standard deviation for the following set of data: 155,95,125,95,115
7. (Application Level) Apply concepts of simple and compound interest, amortization, and annuities to solve finance application problems. (CSLO 1,2,4)	Use the formula for annuities to estimate the Value of an account after 20 years with an interest rate of 5 % compounded monthly with a monthly periodic deposit of $200. Calculate the simple interest from an initial investment of $10,000 over 5 years with an interest rate of 6%.

8. (Application Level) Apply the rules of exponents and logarithms to solve exponential growth and decay problems. (CSLO 1)	For the exponential function $P(t) = 5e^{.000123t}$, t years after 2000. Use the model to:
	   a) Estimate the population in the year 2000.
	   b) Estimate the population in the year 2020.

9. (Application level) Select appropriate sampling technique, describe the population whose properties are to be analyzed, organize and present data, write the equation of a regression line and use a sample correlation coefficient to determine whether there is a correlation in the population. (CSLO 2)	Determine the equation of the regression line given the following ordered pairs: (1,3),(2,5),(3,6),(4,9),(5,11). What is r, the correlation coefficient?