Outcomes for Calculus I:

1. Find the domain and range for a given function.
2. Classify the elementary functions; know their properties and graphs.
3. Understand the inverse of a function graphically, algebraically, and by coordinate pairs.
4. Compute the value of a function at the given independent variable. (Given x, find y.)
5. Solve for an independent variable given a value for the dependent variable. (Given y, find x.)
6. Classify a function as odd, even or neither.
7. Compose two or more functions. Decompose a function into simpler functions.
8. Sketch the graphs of functions using translations and reflections of the elementary functions.
9. Identify whether or not a relation is a function. The relation may be given as a graph, table or algebraic equation.
10. Find and interpret the slope of a line.
11. Find an equation of a line given the slope and a point or given two points.
12. Find the limit of a function using algebra, a table of values or a graph.
13. Determine whether or not a function is continuous. Indicate the points of discontinuity and whether the discontinuity is essential or not.
14. Understand the derivative as the instantaneous rate of change at a point in contrast with the average rate of change between 2 points on a curve.
15. Use the limit definition of the derivative to differentiate a function, understanding that it is the slope of the tangent to the curve at a given point.
16. Use the rules for differentiation, including the chain rule, to find the nth derivative of a function. Functions include the exponential and logarithmic functions.
17. Compute the derivative of the inverse of a function given the derivative of the function.
18. Solve applications involving exponential growth and decay.
19. Apply L'hopital's Rule to find limits of functions.
20. Find an equation of a line tangent to a function at a given point. Use the linear approximation to find approximate values of a function at a given point.
21. Solve applications involving rates of change of a function, including velocity and acceleration problems.
22. Use implicit differentiation to find the derivative of a function.
23. Solve related rates problems.
24. Use Newton's method to approximate a solution to an equation.
25. Find and apply the differential of a function.
26. Understand the relationship between the graph of a function and the graph of its derivative.
    a. Given two graphs, determine which is the function and which is the derivative of the function.
    b. Given the graph of a function, sketch its derivative.
    c. Given the graph of the derivative of a function, sketch the function.
27. Use the first derivative to determine whether a function is increasing, decreasing or neither. Find the critical points.
28. Use the second derivative to determine whether a function is concave up, down or neither. Find the points of inflection.

29. Find absolute extrema of a function on a given interval.
30. Use the First and Second Derivative Tests to find relative extrema of a function.
31. Sketch the graph of a function using techniques from calculus. (Show all intercepts, relative extrema, points of inflection, concavity, and asymptotes.)
32. Solve optimization problems.
33. Understand Integration as the inverse of Differentiation, as the limit of Riemann sums, and as area under a curve.
34. Evaluate indefinite and definite integrals using rules for integration, including substitution.
35. Compute the average value of a function. Solve applications involving average value.
36. Use integration to find the area under a curve or bounded by two curves.
37. Use integration to find the volumes of solids, including solids of revolution.
38. State, understand and apply the Fundamental Theorem of Calculus, the Mean Value Theorem, and the Intermediate Value Theorem.