EXAM 1 MATERIAL:

1. Riemann Sums (Left/Right/Midpoints), definition of a definite integral.
2. Definition of Indefinite Integrals/General Antiderivatives, solving for constants.
3. Fundamental Theorem of Calculus, Both Parts.
4. Net Change and Total Change, dist/vel/acc applications.
5. Substitution.
6. Areas between Curves.
7. Volumes of solids, cross-sectional area (washers/disc) method, cylindrical shells method.

EXAM 2 MATERIAL:

1. Work: Springs, Cables, Pumping, general.
2. Average Value of a function.
3. Integration by parts - products, logs, inverse trig, other.
4. Partial Fractions - long division, distinct linear, repeated linear, irreducible quadratic.
5. Trig Integrals - combinations of sin/cos or sec/tan, know the identities.
6. Trig Substitution - completing the square, drawing the triangle, using identities.
7. Approximating Integrals with the Trapezoid Rule and Simpson's Rule.
8. Improper Integrals - horizontal asymptotes.

NEW MATERIAL:

1. Arc Length.
2. Center of Mass - skipped Winter 2017
3. Solving separable differential equations with initial conditions.
4. Solving and interpreting a differential equation in a story problem
   (a) You are expected to know:
      - Natural Growth/Decay: $\frac{dP}{dt} = kP$.
      - Newton's Cooling/Heating: $\frac{dT}{dt} = k(T - T_s)$.
      - Mixing Problems: $\frac{dy}{dt}$ = RATE IN - RATE OUT.
      - Terminlogy like "...proportional to..." and know homework.

   (b) For all other story problems, the differential equation will be given to you or you will be given steps for how to set it up.