Carthage Mathematics Department
Course Summary for Math 112 Calculus I

1. Credits: 4 credits
2. Semesters Offered: Fall, Spring
3. Text(s): *Calculus* by Smith and Minton, third edition, Early Transcendentals
4. Topics Covered:
    a. Limits: the concept, the formal definition, infinite including L'Hopital's Rule.
    b. Tangent lines and velocity to motivate the derivative.
    c. Derivatives from the definition.
    d. Newtonian and Leibniz notation.
    e. Basic Derivatives of powers, trigonometric functions, inverse trigonometric functions, exponential functions, and logarithm functions.
    f. Computing Derivatives using the sum rule, product rule, quotient rule, and chain rule.
    g. Implicit Differentiation.
    h. The Mean Value Theorem.
    i. Higher order derivatives.
    j. Linear Approximations.
    k. Applications, including related rates, optimization, and graphing.
    l. Newton's Method.
    m. Basic antiderivatives.
5. Skills Enhanced:
    a. Technical writing
        i. At instructor's discretion, approximately 8 pages of written work expected.
        ii. Complete sentences, clear exposition, and correct notation emphasized.
        iii. Revisions based on feedback from instructor are strongly encouraged.
    b. Computer skills
        i. Mathematica: defining and graphing functions, solving equations, derivatives, list structures
        ii. Word: basic document preparation skills, equation editor and importing images
        iii. (optional) Excel: defining functions, graphing
6. Sample Syllabus:
    a. Chapter 0 as necessary
    b. Sections 1.1-1.3, 1.5. One or more of sections1.4, 1.6 and 1.7 are included frequently
    c. Chapter 2
    d. Chapter 3, omitting section 3.9.
    e. Section 4.1
7. Miscellanea
    a. Math 112 is scheduled to meet four days per week, for approximately 200 minutes per week. It is appropriate but not expected that the instructor use more than 200 minutes for instructional purposes.
    b. Math 112 can be taught as a WI course, in which case 16 pages of written work are required, and significant revisions based on feedback are expected. Contact the Chair of the WAC Committee for details.
    c. Math 112 can be taught as an honors course. Contact the Director of Honors for details.
8. Sample Assessment Questions:
    a. <a list of 10 questions that hit the main topics and skills>
    b.