July 19, 2013

1. College: **Science and Mathematics**
2. Department: **Mathematics and Statistics**
3. Course status: **existing; does not require modification**
4. Course prefix and number: **MTH 233**
5. Course title: **Calculus I**
6. Course catalog description: **Limits, continuity, differential calculus of algebraic and transcendental functions with applications, basic antidifferentiation with substitution, definite integrals.**
7. Number of semester credit hours: **4**
8. Estimated total course enrollment per year: **120**
9. Course prerequisites and/or required qualifications for enrolling in the class: **MTH 139, MTH 140 or by placement exam**
10. Course **is not/will not be** available online.
11. Foundational Component Area: **Mathematics**
12. Explain why this course fits into this foundation component area: **Students will use tools of calculus (limits, derivatives and integrals) to make logical conclusions about functions that model real world phenomena. Students will apply differentiation and integration to solve problems involving rates of change and optimization in fields including engineering, physical sciences, social sciences, business and economics.**
13. Core Objectives
    - Critical Thinking - Students will be instructed on using tools of calculus to evaluate the behavior of a function (where it increases, decreases, achieves maximum or minimum values, has points of inflection) and interpret the meaning of these quantities in terms of the phenomenon being modeled by the function. Students will apply critical thinking skills by reading and completing problem sets in which they characterize the behavior of a function by synthesizing information derived from the limit, derivative or integral of a function. In the course requirements (assignments: homework, quizzes, computer lab assignments and exams), students will use creative and innovative thinking (critical thinking) as they sort through an arsenal of mathematical tools to see which tool is most appropriate to solve a given problem.
    - Communication Skills - Students will be instructed as to how mathematical information should be communicated to be sure that the meaning is clear. This instruction will include how to use complete and correct notation, how to visually organize sequential mathematical information and how to provide supporting justification for conclusions. In the course requirements (assignments: homework, quizzes, computer lab assignments and exams), the students will demonstrate written and visual communication skills by constructing tables, graphs and sequential arguments to support conclusions.
    - Empirical and Quantitative Skills - Students will be instructed on using empirical and quantitative skills to draw conclusions about limits of functions based on data from tables and graphs, about the behavior of a function based on values of the derivative over various intervals, and about optimal values of functions that model real world phenomena using limits and derivative tests. In the course requirements

(assignments: homework, quizzes, computer lab assignments and exams), the students will practice and apply empirical and quantitative skills to manipulate and analyze the data derived from application of the limit, derivative, or integral of a function.

Contact person for questions about this submission:

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