Math 150 - College Now Syllabus

SMSU Course Title: Calculus I
SMSU Faculty Mentor: Wije Wijesiri
High School: Lakeview High School
High School Teacher: Daniel Hoffman
Semester and Year: Fall and Spring 2019-2020

Text: Ron Larson and Bruce Edwards, (2014), *Calculus,* 10th Edition, Brooks and Cole. (Or other approved text.*)*

Course Description:
    This is the study of differential calculus of elementary functions, including applications, and the introduction to integration.
    The required preparation is MATH 125 or MATH 135 or three years of high school mathematics including trigonometry.

Learning Outcomes:
    Upon completion of this course students will:
    1.   Have a rudimentary understanding of the concepts of *limit*, *derivative* and *integral*.
    2.   Be able to apply the standard techniques for finding limits and derivatives.
    3.   Be able to set up and solve problems involving the application of differentiation and integration.
    4.   Be able to apply elementary techniques for finding definite and indefinite integrals.

Minnesota Transfer Curriculum Goal 04 - Mathematical/Logical Reasoning:
    1.   Illustrate historical and contemporary applications of mathematical/logical systems.
    2.   Clearly express mathematical/logical ideas in writing.
    3.   Explain what constitutes a valid mathematical/logical argument (proof).
    4.   Apply higher-order problem solving and/or modeling strategies.

Prerequisites:
    In order to be ready for the content of this course, students should have previously covered the following topics.
        a.   Algebraic techniques for solving and manipulating equations
        b.   Functions and Graphing
        c.   Trigonometry

Major Content Areas:
    1.   Limits
        a.   Numerical and graphical estimation
        b.   Techniques of limit evaluation
        c.   The formal definition of a limit
        d.   Continuity
        e.   The Intermediate Value Theorem

    2.   Differentiation
        a.   Tangent lines to curves
        b.   Formal definitions of the derivative
        c.   Rules for finding derivatives of algebraic and trigonometric functions
        d.   Implicit differentiation

    3.   Application of Differentiation
        a.   Optimization
        b.   Curve Sketching
        c.   Related Rates
        d.   Rolle's Theorem
        e.   The Mean Value Theorem

4. Integration
   a. Antiderivatives and Indefinite Integrals
   b. Riemann Sums and Definite Integrals
   c. The Fundamental Theorems of Calculus
   d. Integration by Substitution

5. Exponential, Logarithmic, and Other Transcendental Functions
   a. The Natural Log
   b. Inverse Functions
   c. Exponential Functions
   d. Inverse Trig and Hyperbolic Functions

6. Suggested Additional Topics (Time Permitting)
   a. Area Between two Curves
   b. Solids of Revolution
   c. Arc Length
   d. Integration by Parts
   e. Introduction to Differential Equations

Grades: Final grades will be based on quizzes, tests, and final exam.

Attendance Policy:

Tentative Semester Schedule:

Final Exam: The final exam will be cumulative and given during the final exam period for this class.

No retakes will be given for College Now Mathematics courses. Redoes are done concurrently in project base courses.

SMSU Liberal Education Student Learning Outcomes:
   Upon completion of the Liberal Education Program at SMSU, students will:
   - Understand the techniques and habits of thought in a variety of liberal arts disciplines, having attained an adequate foundation of knowledge in those disciplines.
   - Communicate effectively.
   - Be creative thinkers able to identify, formulate, and solve problems using interdisciplinary perspectives.
   - Be critical thinkers who evaluate information wisely and examine how assumptions and positions are shaped.
   - Understand both physical and social aspects of the world and their place in it.
   - Embrace the similarities among peoples and appreciate the diversity that enriches the human experience.
   - Analyze moral judgments and engage in moral discourse.
   - Practice responsible citizenship in their local and global communities.
   - Continue life-long learning.
   - Integrate mind, body, and spirit, the essential elements of a flourishing life.

College Now Statement:
   College Now is SMSU's concurrent enrollment program. Concurrent enrollment allows qualified high school students to earn college credit in their high school, during their regular school day. College Now classes are taught by qualified high school teachers and are supervised by SMSU faculty members. These classes are actual SMSU courses where students earn actual SMSU credit. There is no cost to the student for these courses, providing an outstanding opportunity for students to earn college credit and jumpstarting their college careers without incurring additional debt.

Academic Honesty:

The aim of the academic honesty policy is to maintain the academic integrity of Southwest Minnesota State University and promote an intellectual climate of honesty and integrity. To maintain an environment of academic integrity all students are required to accept personal responsibility for their work at Southwest Minnesota State University. Any offense against the academic honesty policy compromises the educational integrity of Southwest Minnesota State University and will be considered a grave offense. Offenses against academic honesty are acts which unjustly advance one's academic standing at Southwest Minnesota State University and include knowingly permitting or knowingly aiding a person in an offense against the academic policy.

Plagiarism: Presenting someone else's work or ideas as your own. Plagiarism will include, but not be limited to:

1. Submitting someone else's work or ideas as your own, including but not limited to homework assignments, term papers, research reports, lab reports, group projects, artistic works, tests, or class presentations.
2. Submitting someone else's electronic work as your own, including but not limited to video clips, audio clips, electronic files, electronic programs, and any other copied electronic page, document, article, review, etc.
3. Submitting someone else's work as your own with minor alterations. Paraphrasing without proper citation is also plagiarism.
4. Submitting someone else's work without appropriate use of quotations, paraphrases, footnotes, or references.