Math 150 – College Now Syllabus

SMSU Course Title: Calculus I
SMSU Faculty Mentor: Sherwin Skar
High School: Medford
High School Teacher: Mr. Werk
Semester and Year: 2015-16

Text :   Ron Larson and Bruce Edwards, (2014), Calculus, 10th Edition, Brooks and Cole.

Course Description:
> Differential calculus of elementary functions, including applications. 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 funtions

      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 bases on the following percentages

        Homework, attendance, and participation………………………..15%

        Quizzes, test, and final exam……………………………………………..85%