Course Description

Calculus is the study of continuous change. Generally, it is broken into three parts: Differential Calculus, Integral Calculus, and Multivariable Calculus. This course will cover a quick review of fundamentals before beginning Differential Calculus and will end with an introduction to Integral Calculus.

This course will emphasize the importance of proof and the development of equations. The techniques used to identify a pattern, create an equation, test, expand, and perfect our ideas will be critical as we continue through the year. The course will also include some historical background and older texts for us to work through and understand the development of the ideas that have become fundamental to mathematics.

Course Objectives

Students will study functions and their many traits. We will discover what it means for a function to tend to a limit, whether it is finite or infinite. We will study tangent lines, slopes, and areas of functions. Particularly, we will focus on the intricacies of curved functions and all the many things we can learn about them as well as their applications.

By the end of the year students will be able to:

- Define a Limit
- Calculate limits at a point and infinity
- Use the definition of a Derivative to Identify the slope of a function
- Solve Problems with Product, Quotient, and Chain Rules for Derivatives
- Use Implicit Differentiation Techniques
- Calculate Extreme Values and Sketch a Graph
- Use Optimization to Identify Minimum and Maximum values
- Use the two parts of the Fundamental Theorem of Calculus
- Do basic Integration and Antiderivatives

Topics of Study

First Semester
Chapter 1: Review of Algebra
Chapter 2: Limits and Continuity
Chapter 3: Derivatives

Second Semester
Chapter 3 Continued
Chapter 4: Applications of Derivatives
Chapter 5: Introduction to Integrals

Daily Course Materials

The Textbook is *Rogawski Calculus – Early Transcedentals* (provided by the school).

Writing Utensils, Notebook and/or folder with paper are necessary. Graph paper is recommended as an addition to lined paper.

A TI-83 or TI-84 variant Calculator is acceptable. It needs to be a graphing calculator! Calculators that do symbolic algebra, such as the Casio FX2, Casio 9970Gs, TI-89, TI-92, or TI-nspire CAS cannot be used in class or during an exam.

Grades

Each quarter will have 1000 points worth of material in it with the following distribution:

- In Class Participation: 16% of Total Grade
  8 Weeks at 20 points per week
- Homework/In-class work: 16% of Total Grade
  20 Assignments, lowest 4 are dropped and 16 are graded at 10 points each
- Assessments: 68% of Total Grade. Broken up into two parts:
  - Quizzes: 28% of Total Grade
    6 Quizzes, lowest 1 is dropped and 5 are graded at 56 points each
  - Tests: 40% of Total Grade
    2 Tests at 200 points each

Between all of the extra credit opportunities per quarter, the total amount available is 5% to the overall grade created by 5% in each category:

- Participation: 8 points
- Homework: 8 points
- Assessments: Total of 34 points
  - Quiz: 14 points
  - Test: 20 points

This means that the **maximum** score per quarter is 1050/1000 points (105%).

Assessments

Tests will always be announced at least one week in advance. I usually announce them a month or more in advance, even. Quizzes and Tests are closed book. The best way to prepare for these is to make sure you don't fall behind: do your homework and ask all your questions in a timely manner.

Retakes for tests should be done within one week. **If you miss a test or quiz and do not make it up within one week you will receive a score of 0.**

Participation

Participation is important for being successful in class. Weekly participation will be graded with the following scale:

14/20 is the standard grade for a student who is in class, but passive.

Students can earn a +2 for volunteering to present to the class.

Students can earn a +1 for asking/answering questions in class.

NOTE: participating for the sake of participating, over and over, will actually earn negative points. For example, asking reminder or clarification questions 20 times in class is actually a distraction and will not raise your participation grade.

Students earn a -1 for being unprepared for class (leaving book, notes, etc. in locker)

Students earn a -1 for being late to class

Students earn a -1 for each minor redirection (being asked to be quiet, stop talking, etc.)

Students earn a -3 for each major redirection (throwing things, sleeping, repeated corrections)

Students earn a 0 for a single day with an <u>unexcused absence</u> or if they get a detention in class.

Policies and Procedures

This is <u>not</u> an exhaustive list of all policies and procedures.

- Please use the restroom before class or inform me at the beginning of class to go
- Line up outside the classroom and stop all conversations when class begins
- Have all of your classroom materials when entering the class
- Conduct yourself with respect, courtesy and patience
- No food or drinks allowed in class, aside from a sealed water bottle
- Do your own work on every assignment. Cheating of any kind will not be tolerated
- Absences will strongly affect your ability to do math, try your best to be in class and on time
- If you are absent or miss class, it is your responsibility to gather the assignments and notes for your fellow students, so be good and responsible friends!
- Adhere to the school Honor Code

Late Homework

Turning in an assignment late is something students should avoid. If there is a valid reason for not completing the homework the student should email or speak to the teacher to let them know. Otherwise, homework that is late by one day will receive a 50% deduction in score and homework two or more days late will receive a score of 0.

Homework and Class Assignment Standards

- Please do all homework with pencil.
- Include a header on the paper and write down the problems in addition to your solutions
- Be sure to attempt all problems
- If applicable, check your answers
- Your work must be your own! You may collaborate, but do not copy
- Students will spend an average of 25 minutes per night on homework.

Encouragement and Tips for Success

Take notes during class and use them on homework assignments.

Check your assignments after they are graded and review them to make sure you can solve each problem.

Participate in class. Don't be afraid to work out a problem on the board, the best way to learn is to teach. Take the opportunity, even if you are unsure.

Seek help. Math is hard. Ask questions; don't wait until you are struggling. If you don't understand one thing it will come back to haunt you later.