**Instructors:** Mr. Aaron Cress **Room:**  01-305

**Email:** aaron.cress@polk-fl.net **Website**: [www.arcress.weebly.com](http://www.khsmrbakker.weebly.com)

**Overview:** This course will introduce a variety of topics in the subject of Calculus, including the following: Limits, Derivatives, Minimizations, Integrals, Areas, and Volumes of Rotation. Those enrolled in the AP Calculus class will also be prepared and required upon completion of the class to take the Advanced Placement (AP) Calculus Exam. Upon successful completion of the course, the student will have a functional understanding of Calculus and will be prepared for future studies in collegiate Mathematics. Students will also be able to apply their acquired skills to a variety of real world scenarios and practical applications.

**Required Materials:** Course textbook (provided by instructor), **scientific graphing calculator** (provided by the instructor), loose leaf paper, pencils, and notebook (a combination of 3-ring binder with pockets alongside a spiral notebook is preferred). Students may additionally find a ruler, graph paper, colored pencils, and highlighters to be helpful, but they are not required.

**Calculator:** A graphing scientific calculator is required for this course. At a minimum, the calculator must include basic Calculus functions, such as derivatives, integrals, root-finding, and logarithms. Although there is no required model of calculator, **the recommended model is the TI-84.**

**\*\*I will provide TI-84 calculators each student\*\***

***Students are financially responsible for any loss or damage to the calculators.***

The following calculators are approved for use on the AP Calculus Exam: TI-84+, TI-84 Silver, TI-NSpire, Casio FX-9700, Casio CFX-9800, Casio CFX-9950. (Please ask the instructor for all acceptable models).

**Grading:** This course will be graded according to the approved Polk County grading scale. Thus, grades will be assigned as follows: A (90-100), B (80-89), C (70-79), D (60-69), F (0-59).

*To receive credit for any assignment, students are required to show work. If there is no work shown, no credit will be given.*

**Grade Computations:** Progress within this course will be measured by a variety of graded coursework. This will include daily homework assignments, weekly quizzes, chapter tests, and notebook evaluations. The final grade for each grading period will be based upon a category system using the following percentages (subject to change at this time):

Semester Grading Breakdown:

* Assessments (Tests / Quizzes): 60%
* Homework Assignments: 30%
* End-of-Semester Exam – 10%

Partial credit for all student work is at the discretion of the instructor.

**Homework:** Homework is a vital part of learning and practicing the skills necessary to solve practical problems. Homework assignments will be generally given out on a daily basis. All homework assigned will be due the following class day unless otherwise specified by the teacher. Homework is generally worth 50 points.

**Late Work Policy****:**An assignment handed in within a week of the due date will have no penalty. An assignment that is handed in that is a week late will have 10% credit taken off. Once an assignment is two weeks late, the assignment will receive a 30% deduction. Once an assignment is three weeks or later, the assignment will receive a 50% deduction.

**Homework Format:** In order to prepare students for future success in rigorous college coursework, homework must be neatly and professionally handled. Homework should be completed in pencil and on loose leaf paper. *To receive credit for any assignment, students are required to show work. If there is no work shown, no credit will be given.*

**Makeup Work:** In accordance with the Polk County Student Code of Conduct, makeup work will be given for all absences ***upon request of the student***. All students will receive an extension of 1 day for each day of continuous absence for all makeup work submission deadlines in order to receive full credit. Makeup quizzes and tests will usually be administered after school at a date and time agreeable to both the teacher and the student, and cannot be taken during class periods. However, makeup quizzes and tests will only be graded at full credit if they are completed within 5 school days or 1 day for each day of continuous absence, whichever is greater; beyond this time all makeup quizzes and tests will be assessed a half-credit penalty. Exceptions to these rules may be made for lengthy illness or other extreme circumstances at the discretion of the teacher. In all cases, however, ***it is the responsibility of the student to request any makeup work from the instructor.***

**Notebooks:** Just as homework is vital to practicing the skills taught in this course, notebooks are vital to recording, sorting, and recalling the skills. It is expected that every student take appropriate notes during each lecture video in a manner that is neat, orderly, and conducive to learning.

**Classroom Policies:** Students are expected to abide by the Polk County Student Code of Conduct and all Kathleen Senior High student policies at all times. In particular, the following policies will be enforced:

* Students are expected to be in class on time & prepared for the daily lesson.
* Students are expected to maintain their assigned materials and bring them every day to class.
* Students are expected to be respectful to the instructor and to each other; at a minimum, this means that students are expected to remain quiet while others are speaking and are expected to refrain from using disrespectful language in the classroom.
* **Textbook Check-out:** The textbook is provided at <https://www.pearsonrealize.com/#/>, so textbooks will only be checked out under extenuating circumstances. If you are checking a book out, you must fill out the check-out log and get the teacher’s initials upon return. The student is responsible for damage done to the book, and the full cost of the textbook if it is lost.
* iPods/MP3 players, digital cameras, and other electronic devices are restricted from use in the classroom. A warning will be given for first violations. Students are not allowed to listen to MP3 players during class, especially during assessments. **Cell phones and other smart devices are allowed to be used at the discretion of the teacher. Any use of these devices that does not apply to the lesson at hand is prohibited. This includes texting.**

**CLASS RULES**

1. Follow ALL School rules & Dress Code.
2. No passes the first or last 15 minutes of class
3. No cell phone or electronic devices
4. No passes during instruction time
5. No ear buds or head phones in class
6. No talking when the teacher is talking or during announcements

 **Consequences** for breaking rules:

1. Verbal reminder of proper behavior

2. Individual discussion with the teacher

3. Parent Contact

4. Referral

**Expected Course Schedule**

|  |  |  |
| --- | --- | --- |
| **Chapter** | **Approx. Class Periods** | **Topics Covered** |
| Pre-Calculus Review | 10 | * Trigonometric Functions
* Reciprocal Trigonometric Functions
* Trigonometric Identities
* Logarithmic Properties
* Logarithmic Identities
* Functions of the TI-84
 |
| Chapter 1: Limits and Continuity | 12 | * Limits (An Intuitive Approach)
* Computing Limits
* Limits at Infinity; End Behavior of a Function
* Limits (Discussed More Rigorously)
* Continuity
* Continuity of Trigonometric, Exponential, and Inverse Functions
 |
| Chapter 2: The Derivative | 19 | * Tangent Lines and Rates of Change
* The Derivative Function
* Introduction to Techniques of Differentiation
* The Product and Quotient Rules
* Derivatives of Trigonometric Functions
* The Chain Rule
 |
| Chapter 3: Topics in Differentiation | 17 | * Implicit Differentiation
* Derivatives of Logarithmic Functions
* Derivatives of Exponential and Inverse Trigonometric Functions
* Related Rates
* Local Linear Approximation; Differentials
* L’Hôpital’s Rule; Indeterminate Forms
 |
| Chapter 4: The Derivative in Graphing and Applications | 21 | * Analysis of Functions I: Increase, Decrease, and Concavity
* Analysis of Functions II: Relative Extrema; Graphing Polynomials
* Analysis of Functions III: Rational Functions, Cusps, and Vertical Tangents
* Absolute Maxima and Minima
* Applied Maximum and Minimum Problems
* Rectilinear Motion
* Rolle’s Theorem; Mean-Value Theorem
 |
| Midterm (Chapters 1 – 4) | 3 |  |
| Chapter 5: Integration | 20 | * An Overview of the Area Problem
* The Indefinite Integral
* Integration by Substitution
* The Definition of Area as a Limit; Sigma Notation
* The Definite Integral
* The Fundamental Theorem of Calculus
* Rectilinear Motion Revisited Using Integration
* Average Value of a Function and its Applications
* Evaluating Definite Integrals by Substitution
* Logarithmic and Other Functions Defined by Integrals
 |
| Chapter 6: Applications of the Definite Integral | 13 | * Volumes by Slicing; Disks and Washers
* Volumes by Cylindrical Shells
* Length of a Plane Curve
* Area of a Surface of Revolution
* Work
* Moments, Centers of Gravity, and Centroids
* Fluid Pressure and Force
* Hyperbolic Functions and Hanging Cables
 |
| Chapter 7: Principles of Integral Evaluation | 6 | * An Overview of Integration Methods
* Integrating Trigonometric Functions
* Trigonometric Substitutions
* Numerical Integration; Simpson’s Rule
* Improper Integrals
 |
| Chapter 8: Mathematical Modeling with Differential Equations | 9 | * Modeling with Differential Equations
* Separation of Variables
* Slope Fields; Euler’s Method
* First-Order Differential Equations and Applications
 |
| Test (Chapters 5 – 8) | 3 |  |

**Parent / Student Sign-Off Form**

Dear Parent(s),

 It is with enthusiasm and excitement that I welcome your child to my class this year! I look forward to having the opportunity to help instruct your child in Mathematics.

 Your child has been given a copy of the syllabus for their class. This syllabus includes important information related to the required materials for the class, as well as the expectations of the student with respect to homework, grading, and classroom policies. I hope that you will be able to take time out of your busy schedule to read the syllabus.

 I have also listed below a variety of means to contact me, should the need arise during the year. I have included my school phone number, room number, as well as the address for the website for this course. Please do not hesitate to contact me if you have any questions regarding the course, the materials for the course (such as the model/style of calculator needed), or your child’s ongoing performance in the class.

 Please note that your signature, and your child’s, is requested on this paper below. During the course of this class your child may be assigned materials such as calculators or textbooks that will become their responsibility to maintain. If these materials are lost or damaged during the year, your child will be financially responsible for replacing or repairing them as the situation warrants.

 Once again, I eagerly look forward to the opportunity to serve you and your child this year.

|  |  |
| --- | --- |
| Mr. Aaron Cress |  |
| Mathematics Department | Room 01-305 |
| Kathleen Senior High School | aaron.cress@polk-fl.net |

**I hereby indicate that I have read and am aware of the official syllabus of the course being taught. I also indicate that I am aware that the student will be financially responsible for any lost materials checked out to the student by the school, such as textbooks or calculators, at a value sufficient for replacement of the lost material by the school.**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Parent / Guardian’s Printed Name Parent / Guardian Phone Number**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Parent / Guardian’s Signature Parent / Guardian Email Address**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Student’s Signature Date**