

# Syllabus

## Calculus

### Heritage Academy A University-Model<sup>®</sup> School

The mission of Heritage Academy, a Certified University-Model<sup>®</sup> School, is to partner with Christian parents to prepare college-worthy, character witnesses for Jesus Christ.

#### I. Course Purpose and Content

Calculus 1 is the first course of a typical three semester sequence of college-level Calculus with Analytical Geometry. The concepts covered include algebraic and transcendental functions, rates of change, limits and continuity, differentiations of algebraic, trigonometric, exponential, and logarithmic functions, differentials, applications of differentiation, definite and indefinite integrals, area between curves, volumes and other applications of integration, indeterminate forms, and L'Hopital's Rule.

The objectives of the course include the student being able to:

1. Evaluate limits of functions graphically and analytically
2. Develop the derivative as the slope of a tangent and as the rate of change of a function
3. Differentiate algebraic and trigonometric functions using given formulas, product rule, quotient rule, chain rule, and implicit differentiation techniques
4. Use the first and second derivative tests to identify a function's properties and extrema
5. Integrate algebraic and trigonometric functions using given formulas and the substitution rule
6. Calculate the area of the region between two curves, volumes of revolutions, arc length, and the surface area of revolutions, and work
7. As time allows, we will study integration by parts, partial fractions, indeterminate forms, and L'Hopital's Rule.

#### II. Worldview Integration

Heritage Academy is committed to the teaching of mathematics in such a way that students develop a biblical worldview out of which to think and act. We relate our study of mathematics and the applications of mathematics to the truth that God is the creator of the heavens and the earth (Genesis 1.1, Colossians 1:15-16). God has given man the ability to reason and communicate quantitatively.

#### III. Required Textbook and Supplies

Please reference Required Text Book List and Course Supplies List for the appropriate academic year to identify the textbooks and supplies students will need for this course. Both the Required Text Book List and Course Supplies List are accessible online.

#### IV. Course Guidelines & Student Responsibilities

##### A. Attendance and Participation

Students are expected to attend class and participate in teacher-directed classroom discussions. As communicated in Heritage Academy's Family Manual, a passing grade given at the end of the semester generally assumes that a secondary student has attended at least forty-two class periods during the semester. Failure to meet this minimum attendance requirement may result in an F being awarded and recorded on the student's transcript.

### **B. Absences and Make-up Work**

In case of planned absence, homework that is due during the student's absence must be completed and submitted to the instructor in advance.

Students who are unexpectedly and unavoidably absent due to ill health must submit late assignments within two course periods after the student's return to school. When an unexpected absence must occur, please be sure to notify the school office and the instructor of the students' absence as quickly as possible, preferably before the absence occurs. This contact may occur by phone or by email.

Late work that is submitted simply "late" will be graded and penalized with a ten percent grade reduction for each course period that it is late; homework will not be accepted more than three course periods (1 week) past its due date, unless previous arrangements between the teacher and the student's parent have been agreed to in light of peculiar circumstances that are occurring beyond the family's control.

### **C. Student Conduct and Preparation for Learning**

- 1) The student should come to each class with the appropriate class materials: organized notebook with dividers, paper, pen or pencil, and texts as needed.
- 2) The student should come prepared to each class with completed assignments, ready to be turned in at the beginning of the class period.
- 3) The student should come to class ready to listen, learn, and participate, and take notes.
- 4) The student should always show kindness and respect to the teacher and other classmates.
- 5) In summary, the student should conduct himself or herself in a manner that is worthy of Christ and reflects the life of the Holy Spirit in him/her: ". . . that you may live a life worthy of the Lord and may please Him in every way: bearing fruit in every good work, growing in the knowledge of God, being strengthened with all power according to His glorious might so that you may have great endurance and patience, and joyfully giving thanks to the Father, who has qualified you to share in the inheritance of the saints in the kingdom of light" (Colossians 1:10-12).

### **D. At-Home Investment**

Students will be given an assignment sheet at the beginning of each week to direct them in the at-home exercises and study they will do. Practice of problems and concepts is the key to success and understanding. Homework should be ready to be turned in when called for and if not, will be considered late and graded accordingly. Student can expect to invest 2.5 to 4 hours of study time at home each week.

Course assignments may include any of the following:

- Review of concepts or terms through study of notes or examples in the text.
- Completion of math problems.
- Scripture Memorization: Students may be assigned various Scripture verses to memorize.
- Dialog: Student may be instructed to discuss and/or explore certain topics or concepts with a parent. These assignments will be given purposefully and should not be dismissed.
- Test preparation: Students may be instructed to review notes, texts, previously completed tests, scripture verses etc, in order to prepare for test-taking.
- Other Assignments: additional types of assignments may be given throughout the semester at the discretion of the instructor.

**NOTE: Work must be shown for every problem where it is required. Papers should be neat and legible.** Pencil is preferred, but blue or black erasable ink is also allowed. Please use standard size 8 1/2 by 11 notebook paper. A few problems from each assignment will be selected to be graded.

### E. Assessments

Tests will be given generally at the end of each chapter. Smaller quizzes may be given intermittently throughout the chapters. A comprehensive, two-hour semester final will be given at the end of each semester.

<b>Grade Apportionment</b>	<b>Grading Scale</b>		
Completed Homework..... 20%	100-95...A	86-83...B	76-73...C
Chapter Quizzes and Tests.....65%	94-90...A-	82-80...B-	72-70...C-
Semester Final .....15%	89-87...B+	79-77...C+	69-60...D
			less than 60...F

The final course grade received at the end of the semester in this course reflects the final grade that will be placed on your transcript. To receive semester credit for this class, a student must achieve a percentage grade of 70% or above, translating to a letter grade of C- or above and fulfill attendance requirements.

## V. Parent Responsibilities

### 1. Embracing the University Model

University-Model Schooling at Heritage Academy is driven by two guiding principles:

- to preserve and strengthen God-ordained family relationships;
- to offer students the opportunity to achieve a high degree of academic excellence.

Heritage Academy operates as a University-Model School<sup>®</sup>, designed for families who want their students to flourish from a life anchored in the home yet still gain from the best aspects of traditional, classroom education. Courses offered at Heritage Academy occur every-other-day so that students may realize the benefits of qualified teachers and a focused learning community, yet continue to experience home as the primary, consistent base where parents

remain their foremost guides for spiritual, social, academic, and character formation. Consider ways you may maximize the benefits University-Model Schooling offers to your families. How can as parents utilize the at-home study time this model allows for to nurture deeper relationship and even impart the faith and values you hold dear?

## **2. Fulfilling the Parent Role**

Within the University-Model School<sup>®</sup>, parents commit to fulfill a specified role related to each course in which their student is enrolled, as prescribed by the course's description. Each role identifies specific responsibilities that the teacher relies on the parent to perform, thus facilitating effective home/school partnership whereby students are assured of receiving needed support. For this course, Heritage Academy has designated parents the role of "Guide for Independent Study."

This course mimics that of a junior college program, where independent study skills and disciplined planning for completing homework assignments are necessary. You, as parents, have the opportunity to monitor the independent schoolwork performed by your student, while there may still be occasional times that you are asked to provide particular guidance.

## **3. Monitor Gradelink and View Seven-Week and Thirteen-Week Gradelink Reports**

As your student earns grades for completed tests, quizzes, and various projects and homework assignments, these will be recorded on **Gradelink.com** for you to view at your convenience. My general goal will be to post grades online within a week of their being awarded.

In Gradelink, missing assignments will also be noted. Please take time to follow your student's progress on Gradelink so that you can quickly recognize and explore/address areas of patterns of difficulty or concern that may appear and affirm positive accomplishments.

Gradelink Reports, which will include parent-directed comments related to your student's behavior and progress in class, will be ready for parents to view at the seven-week and thirteen-week point in the semester.

Please contact the office if you have not received your Gradelink login information.

## **4. Attending Parent/Teacher Fellowship**

I hope you will take time to come to Parent/Teacher Fellowship scheduled during the 6<sup>th</sup> week of each semester. This will give you and I brief opportunity to connect face-to-face and discuss your student's progress, making the most of the partnership that is so vital to students' success within the University-Model<sup>®</sup>.

## **VI. Instructor Contact Information**

Teacher contact information will be provided on the weekly communication sheets that will be distributed in class; it may also be found in the school directory.