



**Aims**  
COMMUNITY COLLEGE  
COURSE SYLLABUS

### Course Details

Course Name	Calculus I
Course CRN and Term	41102 – Spring, 2021
GT Pathways Category	GT-MA1
Credits and Delivery Method	5 Credits. Remote delivery.
Time Expectation	12 hours per week.
Location	Remote
Meeting Dates and Time	MWF, 2:45 – 4:10 p.m.
Instructor	Harry S. Mills
Instructor E-mail	<a href="mailto:hmills1@online.aims.edu">hmills1@online.aims.edu</a>
Instructor Office Location	EDBH 134K
Instructor Phone Number	970-290-0550
Office Hours	By appointment, pending student input.
The drop deadline for this course is	January 27 <sup>th</sup> , 2021 Your ability to add courses after this date may be limited. See your advisor for assistance with class scheduling.
The course withdrawal date for this course is	April 7 <sup>th</sup> , 2021 Remember, withdrawal does not come with any reductions or refunds in tuition. A withdrawal will also place a “W” grade on your transcript. Please contact your advisor to see if a withdrawal is appropriate given your specific situation.
Other Important Dates	<a href="https://www.aims.edu/student/schedule/calendars/">https://www.aims.edu/student/schedule/calendars/</a>
Student Services	<a href="https://www.aims.edu/student/services.php">https://www.aims.edu/student/services.php</a>

### Course Requirements

Prerequisite(s)	MAT 121 and MAT 122, with grade of C or better, or assessment. Five credits.
Co-requisite(s)	None
Standards of Behavior & Policies – These statements apply to every course at Aims Community College and are hereby incorporated into this document.	Closely review these policies at: <a href="https://www.aims.edu/policies/standard-syllabus/">https://www.aims.edu/policies/standard-syllabus/</a>
Materials	Stewart Calculus, 8 <sup>th</sup> Edition (an older edition, cheaper on Amazon!) WebAssign: Go to webassign.net and use the following information to find us: Instructor: Steve Mills Section: 201, Section R11 Class Key: aims 8483 0227
Other	This box is for any specific requirements for your course such as scrubs, safety glasses, steel-toed boots, etc.



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## Course Information

### Course Description:

**Course Learning Outcomes** – According to the Colorado Community College Common Course Database, upon completion of this course, the student/learner should be able to:

1. Evaluate limits using appropriate analytical, numerical or graphical techniques.
2. Analyze the continuity of functions.
3. Apply the definition and techniques of differentiation to find derivatives, including derivatives of transcendental functions.
4. Analyze functions represented by an equation or a graph using derivatives and limits.
5. Create graphs of functions using properties of derivatives and limits.
6. Apply techniques of integration to find the antiderivative of a function.
7. Evaluate definite integrals using Riemann Sums and the Fundamental Theorem of Calculus.
8. Utilize Calculus techniques to solve application problems.

**Topical Outline** – These topics will be covered in class, but not necessarily in this order:

- I. Limits using appropriate analytical, numerical or graphical techniques
  - a. Limits computation
  - b. Properties of limits
  - c. Limits at infinity
  - d. Infinite limits
- II. Continuity of functions
  - a. Definition of continuity
  - b. Discontinuities with respect to type (removable or non-removable)
  - c. Intermediate Value Theorem
- III. Definition of derivative and techniques of differentiation
  - a. The limit definition of a derivative
  - b. Basic rules of derivatives
  - c. Product Rule
  - d. Quotient Rule
  - e. Chain Rule
  - f. Higher order derivatives
  - g. Implicit differentiation
  - h. Introduction of differentials
  - i. Derivatives of trigonometric functions
  - j. Derivatives of inverse trigonometric functions
  - k. Derivatives of exponential and logarithmic functions
- IV. Functions represented by an equation or a graph using derivatives and limits
  - a. Critical values
  - b. Absolute extrema on an interval
  - c. Increasing and decreasing intervals

- d. First and Second Derivative Tests for relative extrema
- e. Inflection points
- f. Intervals of concavity
- g. Graphical connection between  $f$  and  $f'$
- h. Asymptotic behavior with limits
- V. Graphs of functions using properties of derivatives and limits
  - a. Graphing techniques without technology
  - b. Graphing techniques with appropriate technology
- VI. Techniques of integration to find the antiderivative of a function
  - a. Indefinite integrals
  - b. Integration by substitution
  - c. Integration of trigonometric functions
  - d. Integration involving inverse trigonometric functions
  - e. Integration involving exponential and logarithmic functions
- VII. Definite integrals using Riemann Sums and the Fundamental Theorem of Calculus.
  - a. Riemann's Sums
  - b. Definite integrals
  - c. Fundamental Theorem of Calculus
  - d. Integration techniques with appropriate technology
- VIII. Calculus techniques to solve application problems
  - a. Mean Value Theorem
  - b. Equations of tangent lines
  - c. Related rates
  - d. Rates of change
  - e. Optimization
  - f. Net signed area
  - g. Area between two curves

**State General Education and Common Learning Outcomes:** (for GT Pathways Courses)

**Competency: Quantitative Literacy:**

Students should be able to:

- 1. Interpret Information**
  - a. Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).
- 2. Represent Information**
  - a. Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).
- 3. Perform Calculations**
  - a. Solve problems or equations at the appropriate course level.
  - b. Use appropriate mathematical notation.
  - c. Solve a variety of different problem types that involve a multi-step solution and address the validity of the results.
- 4. Apply and Analyze Information**
  - a. Make use of graphical objects (such as graphs of equations in two or three variables, histograms, scatterplots of bivariate data, geometrical figures, etc.) to supplement a solution to a typical problem at the appropriate level.

- b. Formulate, organize, and articulate solutions to theoretical and application problems at the appropriate course level.
  - c. Make judgments based on mathematical analysis appropriate to the course level.
- 5. Communicate Using Mathematical Forms**
- a. Express mathematical analysis symbolically, graphically, and in written language that clarifies/justifies/summarizes reasoning (may also include oral communication).

**Aims Common Learning Outcomes** – These outcomes define the expectations of an Aims Community College education and provide the benchmarks against which the college holds itself accountable. Find the outcomes at <https://www.aims.edu/prospective/common-learning-outcomes.php>

### **Course Delivery Method**

Schedules and delivery methods are subject to change as necessary due to inclement weather, health and safety issues, and other circumstances. For the latest information on College decisions related to course delivery, visit [www.aims.edu](http://www.aims.edu)

### **Code of Conduct**

In an effort to keep our college community safe, students are expected to comply with health guidelines as directed by the College, public health officials, and/or ordinance of a municipality, county, Governor of the State of Colorado or any Executive Order of the President of the United States. A complete copy of the Student Code of Conduct can be found at [www.aims.edu/student/conduct](http://www.aims.edu/student/conduct).



### **Face Coverings**

To help mitigate the transmission of COVID-19, it is required that all students wear masks or other face coverings in classrooms, laboratories and other similar spaces where in-person instruction occurs. The masks/face coverings must cover both nose and mouth, be worn for the duration of class, inside all college buildings, and outside whenever you are or are likely to come within 6 feet of another person. Students who do not comply with face covering and social distancing expectations will be asked to leave class and referred to the Dean of Students. We are a community of care and together we will work to ensure we can all engage in learning in the safest way possible.

### **Reuse of Instructional Materials**

Reuse or distribution of instructional materials (i.e. PowerPoints, videos, class recordings, assessments, etc) or student created content (i.e. online discussion posts, presentations, etc) without approval is prohibited.



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- **Attendance** – Officially, attendance counts 10% towards your grade. Unofficially, it will only be a factor if your performance is borderline between 2 grades. This course is delivered, remotely, and all notes generated during the sessions and a video recording of each session will be posted on [harryzaims.com](http://harryzaims.com).
- **Communication and Feedback**  
Good thing about feedback: It’s instant.  
Bad thing about feedback: It’s online.  
This course, being designated “remote,” will administer all homework and tests online, through WebAssign.

Use [hmills1@online.aims.edu](mailto:hmills1@online.aims.edu) to contact me by e-mail. This may also be accomplished by clicking on “E-Mail” in the Course Shell and clicking on “Mills, Steve” in the listing.

Call or text me at 970-290-0550 if you have something urgent, or wish for a 1-on-1.

As I have posted videos and notes on virtually all of the homework, I will not be giving a full-blown formal lecture, generally. Instead, I will expect students to read ahead and hit me with questions, so I can spend our time together on what you need, when you need it. I really want you to make use of the resources available and I don’t want to waste time telling you things you already got from the videos, where I explain pretty much everything in a problem-solving context.

If you want to make sure of your attendance numbers, just join the ZOOM and continue your work, with an ear out (or not) for what’s being said. I care about the learning, not jumping through hoops for bureaucrats. You would be wise to check out the notes, regardless, but as long as you’re keeping up on the homework and performing adequately, I’m not very interested in riding herd on you.

- **Grading**  
Tests: 70%  
Homework: 20%  
Attendance: 10%\*

\*Attendance at the live lecture will only count if it can make a difference. If I see you’re on the cusp of 2 different letter grades, I’ll drill deeper into your actual attendance, a permanent and perfect record of which is maintained automatically by the ZOOM program documentation accompanying the recordings.

**IMPORTANT NOTE:** As we *are* testing online, using a learning management system, you get two (2) shots at every test. So take it early, then take it again after reviewing it. I *think* I can set it up that way with one test. If I can’t I’ll just copy it and post a 2<sup>nd</sup> version of it for a re-take. One of the benefits of WebAssign testing.

Grading Scale		
90% - 100%	A	(Superior and excellent)
80% - 89%	B	(Above average)
70% - 79%	C	(Average)



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60% - 69% D (Below average level of achievement)  
Below 60% F (Not acceptable)

- **Course Schedule:** <https://harryzaims.com/201/201-spring-21/syllabus-and-schedule/201-schedule-spring-21.pdf>