
Math 1060-300 (architecture): Calculus of One Variable I

FALL 2018

MWRF 8:00-8:50am, Martin M-307 (M-201 on Thursdays)

Instructor Matthew Macauley (macaule@clemson.edu)

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OFFICE HOURS: (tentative!) MWF 9-10am, or by appointment.

WEBSITE: http://www.math.clemson.edu/~macaule/classes/f18_math1060/

Textbooks (only the free books are required).

- *Calculus as a Liberal Art*, by W.M. Priestley. Springer, 1998. (recommended)
- *Ideas of Calculus*, by J.F. Fleron, P.K. Hotchkiss, and C. von Renesse with V. Ecke. Published online in the *Discovering the Art of Mathematics* project on *Mathematical Inquiry in the Liberal Arts*. 2015. [Freely available online](#).
- *Active Calculus 2.0*, by M. Boelkins, D. Austin, and S. Schlicker. CreateSpace Independent Publishing Platform, 2018. [Freely available online](#).
- *APEX Calculus*, by G. Hartman. CreateSpace Independent Publishing Platform. 4th edition, 2018. [Freely available online](#).

Course Description It is no a coincidence that historical periods of heightened intellectualism have witnessed the synergistic flourishing of mathematics, the arts and humanities, and architecture. The Ancient Greeks are known as much for Euclid's *Elements* as they are for the writings of the Plato and Socrates, the grandeur of the Parthenon and Acropolis, and the art that adorned it. The European Renaissance produced artist and mathematician Leonardo da Vinci, as well as Newton and Leibniz, who invented the Calculus. The architecture of this period exhibits beauty while emphasizing visually pleasing mathematical concepts such as geometric structure and proportion. Though the traces of these ideas date back to ancient times, they were inspired by the inherent beauty and harmony of mathematics that drew people like da Vinci, Newton, and Leibniz to their scholarship. It is unfortunate that in modern times, Calculus is taught without a historical context, and without an emphasis of the beauty that lies within. This class will attempt to buck that trend. It is primarily a mathematics course, and students will still learn the main ideas from Calculus I and II in the same level of rigor as they would in an engineering course. This should *not* be thought of as a "light" version of calculus, but rather a more fun version, with a particular appeal to students in the arts, architecture, and humanities.

Prerequisite Score of 80 or better on the Clemson Mathematics Placement Test.

Access I prefer to make non-copyrighted materials freely available to everybody on the course webpage. *Warning:* Websites such as *Course Hero*, that download such materials and try to repackage and sell it to students, are a SCAM! (Spread the word!)

Homework Most homework will be assigned using the open source program WeBWork, freely available online at <https://ftcourses.webwork.maa.org/webwork2/ft-clemson-math160/>. Late assignments will NOT be accepted.

Quizzes	I will give in-class quizzes 1–2 times a week.										
Tutoring	The <i>Academic Success Center</i> holds free tutoring sessions for Math 1060, six days a week. The current weekly schedule can be found here: https://www.clemson.edu/asc/courses/tutoring/index.html .										
Policies	<ul style="list-style-type: none"> • All use of cell phones and laptops are prohibited during lecture and exams. Tablets may be used for note taking only. • I do not impose arbitrary numeric cutoff lines for final grades, e.g., A=90+, B=80–89, etc. Rather, I grade by natural “clusters.” • I prefer to know in advance if you cannot make a lecture, as that’s just simple courtesy. Attendance will not factor into your final grade, but I will use it, and possibly your homework score, to decide borderline cases (e.g., if you end up “between clusters”). • Quizzes will be given 1–2 times a week, to encourage you to keep up with the material, and as self-assessment. • If you get an A or B on the final exam, then you will get at least that grade in the course, as long as you (<i>i</i>) attend class very regularly, AND (<i>ii</i>) maintain a passing grade on the homework. 										
Learning Outcomes	<p>By the end of the semester, students will be able to:</p> <ul style="list-style-type: none"> • Explain the significance of the infinite and the infinitesimal to calculus, architecture, and philosophy, and what these all have in common. • Compute derivatives of a wide variety of single-variable functions. • Use differential calculus to solve optimization problems. • Apply the fundamental theorem of calculus to relate the rate of a function to its cumulative sum over an interval. • Apply integration techniques (e.g., integration by parts, trigonometric integrals, trigonometric substitution, partial fractions, and improper integrals) to evaluate integrals, with applications in engineering and science. • Demonstrate the ability to work on learning activities in small groups to develop problem-solving and communication skills. 										
Grading	<p>The final grade will be calculated as follows:</p> <table> <tr> <td>QUIZZES:</td><td>12%</td></tr> <tr> <td>HOMEWORK:</td><td>22%</td></tr> <tr> <td>MIDTERM 1:</td><td>22%</td></tr> <tr> <td>MIDTERM 2:</td><td>22%</td></tr> <tr> <td>FINAL EXAM:</td><td>44%</td></tr> </table> <p>Note that this adds up to 122% – your lowest midterm grade OR half the weight of your final exam will be dropped.</p>	QUIZZES:	12%	HOMEWORK:	22%	MIDTERM 1:	22%	MIDTERM 2:	22%	FINAL EXAM:	44%
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Portfolios	<p>This course contributes to general education requirements in the Mathematical, Scientific, and Technological Literacy competency. Any exams or activities, particularly the more challenging or complex ones, could be placed in a portfolio as evidence for <i>Objective 1: Demonstrate mathematical literacy through solving problems, communicating concepts, reasoning mathematically, and applying mathematical or statistical methods using multiple representations</i>. Any learning activities where computer software or a graphing calculator was used to advance learning and understanding of mathematical concepts could be placed in a portfolio for <i>Objective 4: Apply information technologies to intellectual and professional development</i>.</p>										

Key Dates	Aug 22 (Wed)	Classes begin; late enrollment fee applies
	Aug 28 (Tue)	Last day to register or add a class
	Sep 4 (Tue)	Last day to drop a class or withdraw from the University without a W grade
	Oct 31 (Tue)	Last day to drop a class or withdraw from the University without final grades
	Nov 5-6 (M-Tu)	Fall break
	Nov 21-23 (W-Fr)	Thanksgiving break
	Dec 7 (Fri)	Last day of class
	Dec 10 (Mon)	MATH 1060 common Final Exam, 11:30am–2:00pm.
	Dec 13 (Thu)	MWF 8am class scheduled Final Exam, 11:30am–2:00pm.
	Dec 20 (Thu)	Graduation

Copyright Statement Some of the materials in this course are possibly copyrighted. They are intended for use only by students registered and enrolled in this course and only for instructional activities associated with and for the duration of the course. They may not be retained in another medium or disseminated further. They are provided in compliance with the provisions of the Teach Act. Refer to the Use of Copyrighted Materials and “Fair Use Guidelines” policy on the Clemson University website for additional information: <http://clemson.libguides.com/copyright>.

The official statement on Academic Integrity

As members of the Clemson University community, we have inherited Thomas Green Clemson’s vision of this institution as a *high seminary of learning*. Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.

When in the opinion of a faculty member, there is evidence that a student has committed an act of academic dishonesty, the faculty member shall make a formal written charge of academic dishonesty including a description of the misconduct, to the Dean of the Graduate School. At the same time, the faculty member may, but is not required to, inform each involved student privately of the nature of the alleged charge.