



WILLIAM & MARY

DEPARTMENT OF MATHEMATICS

Math 311 Elementary Analysis

Summer 2020

The information below is given tentatively and subject to changes during the term. The course page can be found at prclare.people.wm.edu/m311x20 and will be regularly updated.

General Organization

Textbook: *Understanding Analysis*, 2nd ed. by S. Abbott

Scheduled lectures: MTuWTh 10:00 - 12:00 via Zoom

Instructor: **Pierre Clare** (130 Jones Hall - <https://cwm.zoom.us/my/prclare>)

Office hours: by appointment

Last day to add/drop	June 5
Last day to withdraw	June 19
Midterm	TBA
Final Examination	TBA

Grades

The course grade will be based upon the scores on the midterm examination (30%), the homework (20%) and participation (10%) and the final examination (40%).

The final grade will be assigned according to the following scale:

$$\begin{aligned} 100 &\geq \mathbf{A} \geq 93 > \mathbf{A-} \geq 90 \\ 90 > \mathbf{B+} &\geq 87 > \mathbf{B} \geq 83 > \mathbf{B-} \geq 80 \\ 80 > \mathbf{C+} &\geq 77 > \mathbf{C} \geq 73 > \mathbf{C-} \geq 70 \\ 70 > \mathbf{D+} &\geq 67 > \mathbf{D} \geq 63 > \mathbf{D-} \geq 60 > \mathbf{F}. \end{aligned}$$

Participation and Homework

The participation grade will be assigned as follows: every day before class, you will submit a question pertaining to the day's assigned reading. A meaningful question is worth 5/5 points. Not submitting a question is worth 0/5.

Written homework will be assigned weekly. Extensions may (and usually will) be granted if requested at least twenty-four hours before the due date. Late homework will not be accepted.

Academic Integrity

The **Honor Code** applies to all activities related to this course.

Cooperation on homework is permitted and encouraged, but if you work together, do not take any paper away with you. In other words, you can share your thoughts (say on a blackboard or draft paper), but you have to walk away with only your understanding. In particular, you must write the solution up on your own. You must acknowledge any cooperative work by adding a mention such as *Joint work with Collaborator₁,... and Collaborator_n* right below your name on the front page.

On exams, you may not give or receive help from anyone. Exams in this course are closed book, and no notes, calculators or other electronic devices are permitted. The **Honor System** is responsible for resolving any suspected violations of the Honor Code. Do not hesitate to ask the instructor beforehand if you have any questions as to whether some action would be compatible with the Honor Code.

ADA Considerations

Students with disabilities who will be taking this course and may need disability-related accommodations are encouraged to make an appointment to see their instructor as soon as possible.

William & Mary accommodates students with disabilities in accordance with federal laws and university policy. Any student who feels they may need an accommodation based on the impact of a learning, psychiatric, physical, or chronic health diagnosis should contact Student Accessibility Services staff at 757-221-2512 or at sas@wm.edu to determine if accommodations are warranted and to obtain an official letter of accommodation. Visit wm.edu/sas for more information.

Course Material

Learning Objectives

In this course, we will introduce and study the basic objects of mathematical Analysis. After discussing general properties of ordered fields, we will focus on rational and real numbers. We will work in the general context of metric spaces to study fundamental topological properties, such as compactness and connectedness, as well as sequences and series.

The last part of the course will be dedicated to the study of functions of the real variable, for which we will prove fundamental results of differential calculus as well as, time permitting, the theory of the Riemann Integral, including the Fundamental Theorem of Calculus.

Schedule of topics

Following the exposition in Abbott's text, a tentative schedule is as follows:

- **Week 1:** The real numbers
- **Week 2:** Sequences and series
- **Week 3:** Basic topology of \mathbf{R}
- **Week 4:** Limits and continuity
- **Week 5:** Derivatives

Week	Date	Topic
1	6/01	Preliminaries, rationals and irrationals
	6/02	The axiom of completeness
	6/03	Consequences of the completeness
	6/04	Cardinality
2	6/08	
	6/09	
	6/10	
	6/11	
3	6/15	
	6/16	
	6/17	
	6/18	
4	6/22	
	6/23	
	6/24	
	6/25	
5	6/29	
	6/30	
	7/01	
	7/02	