Instructor: Eric Towne, etowne@fas.harvard.edu, 207-345-3645.

Website: http://www.people.fas.harvard.edu/~etowne/mathe15spring2017.html

Meetings: During the first four weeks of the course, you will watch videos to learn first an intuitive definition and then a formal definition of the limit. A worksheet (titled Day One, Day Two, etc.) for each video is posted on the course website; please print it out before watching the video and fill in the answers as you watch.

Future meetings will be arranged based on availability of distance students and will be conducted via the online learning platform Zoom.

Topics: The notion of the limit is at the core of both of the main topics of calculus – differentiation and integration. However, most calculus courses give only a vague definition of what is meant by a limit. This is perhaps not surprising when one considers that calculus was practiced with great success for nearly two hundred years before mathematicians finally developed a satisfactory definition of the limit (using ideas formulated independently by Bolzano in 1816 and Cauchy in 1821, which were refined by Weierstrass in the 1830s). In this seminar, we will take a close look at this definition and explore how it is used.

Goals: To learn about the theory behind limits so that you (as a current or future math teacher or interested calculus student) can answer the student who says, “But what does it really mean when we say h goes to zero?”

To practice teaching and get constructive feedback.

To observe others’ teaching methods to see some new techniques and ideas.

Format: The main focus of the seminar will be student presentations. You will design and present (to me and your classmates via Zoom) a 45-minute lesson on a topic of limits we have not covered (see Lesson Ideas file on the course website).

I will be available by email, phone, and through Zoom to help you with any questions you have as you prepare your lesson.

Please see our course website for the link to our Zoom site and suggestions on using Zoom to teach your lesson.

Grading: Completion of doodle scheduling poll by February 3 5%
Submission of your lesson preferences by February 18 5%
Participation* 30%
Lesson Presentation 60%

*The participation portion of the grade includes your on-time and active participation in the lessons taught by your classmates via Zoom.