MTH 415/515 Real Analysis
Cleveland State University, Department of Mathematics
Course Syllabus, Fall 2013

Class meetings: Mon/Wed 4:00–5:50pm in MC 306A

Instructor: Peter Bubenik

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Instructor’s web page: http://academic.csuohio.edu/bubenik
Course web page: https://bblearn.csuohio.edu/MACAuth/login.jsp

Course Description. This course gives a rigorous introduction to the real numbers and their mathematics. We will take a sophisticated look at some of the topics of calculus: sequences and series, functions, derivatives, and integration. We will study new topics such as the topology of the real numbers, sequences and series of functions, fractal sets and metric spaces. We will use our theory to develop one of the most useful tools of applied mathematics: Fourier series.

Our travels will uncover many surprises: there are way more irrationals than rationals, rearranging a series can change its sum, some sets have a fractional dimension, and there are continuous functions that aren’t differentiable anywhere.

Course Objectives. To appreciate formal reasoning, and to be able to apply it in proofs. To understand the basic properties of the real numbers and functions of real numbers.


Course web page. Homework assignments, course announcements, and this syllabus will be made available on the course web page. A discussion area will also be available.

Reading the textbook. It is expected that you read ahead in the textbook before each class.

Attendance and Participation. It is expected that you attend all or almost all classes and participate by asking and answering questions in class and on the course web page.

Homework. The best way to learn mathematics is to do mathematics. There will be frequent homework assignments. They will be mostly based on problems from the textbook.

You are encouraged to discuss the exercises with your classmates, but you must write up your own solutions. Copying solutions or allowing your solutions to be copied is considered cheating. If you are unable to do any of the homework ask me for help as soon as possible.

Presentations. Students will be regularly asked to present their work from Homework assignments and from reading the textbook to the class. We will work together to fix up any arguments that are incorrect or unclear.
Grading. Written homework 40%, Presentations 20%, Midterm exam 15%, Final exam 25%

Undergraduate. A: 100% – 90%, A-: 89% – 85%, B+: 84% – 80%, B: 79% – 77%, B-: 76% – 74%, C+: 73% – 71%, C: 70% – 68%, D: 67% – 60%, F: 59% – 0%

Graduate. A: 100% – 90%, A-: 89% – 85%, B+: 84% – 80%, B: 79% – 77%, B-: 76% – 74%, C: 73% – 68%, F: 67% – 0%

Tips for success.
- Before each lecture, read your notes from the previous lecture and read ahead in the textbook.
- We will spend up to ten minutes at the start of every class looking at one or two of the assigned problems. Come to class with your questions ready.
- Ask questions during class; if something is confusing, you aren’t the only who would like it to be clarified.
- Discuss the homework with your classmates.
- Post questions and/or answers to the discussion area of the course web site.
- Come to my office hours. To get the most out this time do the following: For homework problems you cannot do, work them out as far you can on your own ahead of time. For more general difficulties, try to pinpoint what it is you are having trouble with. If you can’t attend my usual office hours, make an appointment to see me at another time.
- For help not specific to this course myCSU lists resources available to you. An Academic Resource that may be useful is the Tutoring & Academic Support Center. A Health Resource that may be useful is the Counseling Center. Financial Aid & Scholarships and Jobs & Careers may also be helpful.

Cheating and plagiarism. Cheating and/or plagiarism will not be tolerated. You are cheating if you allow a classmate to copy your work. It is also cheating if you look at someone else’s work (e.g. classmate, textbook, or something on the web) while you are writing your homework solution. Cheating is also not permitted on in-class exams. If cheating occurs, the student will receive a grade of 0 for that component of the course. Information regarding the official CSU policy regarding cheating and plagiarism can be found in the CSU Code of Student Conduct.

Disabilities statement. Students with disabilities which may affect their ability to complete course requirements in this class may request appropriate accommodations by registering with the Office of Disability Services and discussing the nature of their situation.

Differences between MTH 415 and MTH 515. Graduate students will be required to do more work and will be held a higher qualitative standard. They should synthesize and apply knowledge at a more sophisticated level. They should demonstrate in writing a more sophisticated understanding of the course material.