MATH 214-03 Foundations of Mathematics
SPRING 2019

Lecture: MWF 1–1:50, Morton 40
Instructor: Eric Swartz
E-mail: easwartz@wm.edu
Office hours: MWF 11–12 and by appointment, Jones 133
Course homepage: We will use **Blackboard** as our course homepage.
Important dates: January 28 (Add/drop deadline), March 15 (Withdraw deadline)

Content: Fundamentals of advanced mathematics: Propositional logic, quantifiers and methods of proof; naive set theory including mathematical induction, relations, orders, functions, and countability.

Goals: This course will give a careful examination of the integers and the real numbers, as a route toward the methods of higher mathematics. A major goal of the course is to develop logical reasoning and mathematical proof writing skills – essential for all higher mathematics studies.
The goal of this course is to help you begin to form carefully reasoned, clearly expressed mathematical arguments. Developing clear expression of your reasoning is an absolute must and is as important as arriving at a "correct answer," and in this course will be valued as such.

Textbook: *The Art of Proof* by Matthias Beck and Ross Geoghegan.
This text is available online for free at: `http://math.sfsu.edu/beck/papers/aop.noprint.pdf`
We will cover Chapters 1–6, 8–13.

Homework: Homework will be assigned in each class. The definitive list of assigned homework will be posted on Blackboard. You are strongly encouraged to do all or most of each assignment before the next class. However, correctness is even more critical than promptness. Incorrect proofs will be returned for you to repair, and you will not receive a grade from me until they're completely correct. The final due date for each problem is two weeks after the problem is assigned or at the final exam, whichever date comes first. (If class does not meet two weeks after a problem is assigned, then it's due at the following class meeting.)
Your final homework grade will be based on the number of *completely correct* proofs handed in on time, *regardless of how many incorrect versions you turned in previously.*
Don't wait until the day before a problem is due to make your first attempt! Especially early in the semester, as you are getting used to writing proofs, problems may take multiple tries to get completely correct! Turn in an attempt as soon as possible after it's assigned so that you can get feedback.
Late homework will only be accepted under truly extraordinary circumstances (e.g., major surgery).

In order to be counted correct, a proof must be written in clear, correct English.
While you may discuss the problems with your classmates (and you are in fact encouraged to do so!), copying someone else's work is strictly prohibited and will result in scores of zero for *everyone* involved. In particular, you may not use another student's final work as a "model," and you may not allow other students to study your final work. Everyone must hand in final proofs separately. Needless to say, copying or adapting a proof from another source (e.g., book or internet) is strictly prohibited as well.

LaTeX: Your homework assignments must be typeset using LaTeX. Being able to use this software is a useful skill to have, and the programs are available for free. Here are some sample options:

Windows: MikTex `http://miktex.org/download`
Mac: MacTex `http://tug.org/mactex/`
Linux: Kile (if you use Linux, I'm assuming you will know how to find it)
You may also use the online editor available at `https://www.overleaf.com/`. Simply sign up for free, start a new project, and paste the text from "sample.tex" into the source side. It is easy to google commands/techniques that you don't know, but a list of common symbols is available at `http://cklixx.people.wm.edu/TeX-symbol.pdf`

Tests: There will be a midterm (covering roughly the first five or six chapters) on Friday, March 1. The final exam will be comprehensive and will take place Monday, April 29, from 2 – 5 PM.

Grading:

Homework:	50%
Midterm:	20%
Final:	30%

Final letter grades are assigned using the scale: A 93–100, A- 90–92, B+ 87–89, B 83–86, B- 80–82, C+ 77–79, C 73–76, C- 70–72, D+ 67–69, D 63–66, D- 60–62, F <60
This scale is not rigid! Lower cutoffs are sometimes used.

Honor code: Students are expected to uphold the honor code in this class. Any suspected infraction will be reported. Rest assured, I am older and more experienced than you are. **I will catch you if you cheat!**