MATH 112: INTRODUCTION TO ANALYSIS

SECTION S01, SPRING 2015

Place:	Library 389
Time:	MTWF, 8–8:50A.M.
Instructor:	Kyle Ormsby (`ormsbyk@reed.edu`)
Office Hours:	TW 11A.M.–noon & θ 2:30–3:30P.M. in Library 313
	Also by appointment and chance encounter
Tutoring:	SuMTWθ 7–9P.M. in Library 387
	Individual tutoring through Student Services
Textbook:	*Introduction to Analysis* by Irena Swanson
	Available online and at the bookstore
Website:	`people.reed.edu/~ormsbyk/112/`

Summary. In this course, we will study introductory analysis, the part of mathematics which analyzes size, distance, and change via the real and complex number systems. More importantly, we will learn how to practice mathematics as mathematicians do: via axiomatization, creative insight, and proof. Topics covered include the field axioms, the real and complex numbers, sequences, series, complex functions, complex differentiation, power series, and the complex exponential.

Class meets Monday, Tuesday, Wednesday, and Friday each week. With some exceptions, we will take a micro-quiz each Wednesday, and homework is due each Friday.

We will use Irena Swanson's course notes, *Introduction to Analysis*, which are available for free online.[1] Printed copies are available for a fee at the bookstore. Reading will be assigned from this text in advance of most course meetings, and many homework problems will be drawn from it.

Participation. Our meetings will use your reading as a springboard for discussion of and deeper interaction with the mathematics presented. As such, it is key that readings be completed in advance of our meetings. All of our meetings will place an emphasis on active engagement with mathematics, proofs, and problem solving.

Homework. Homework is due at the start of class each Friday (excluding holidays). In addition to written comments, each problem will be evaluated on a five-point scale:

  5 – Perfect, well-communicated solution.
  4 – Right idea with minor errors in mathematics or exposition.
  3 – Right idea with major problems in execution.
  2 – Incorrect solution with significant idea.
  1 – Incorrect solution with relevant idea.
  0 – None of the above.

Date: 26.I.15.

[1] `http://people.reed.edu/~iswanson/analysis.pdf`

Late assignments *will not be accepted*. Please turn in clean solutions (not scratch work)[2] and provide explanations or proofs except when explicitly noted otherwise.

This term we will experiment with student production of solution sets. I will select well-presented solutions, scan and anonymize them, and then post them to the course website. *If you do not want your solutions published, please email me expressing your desire to opt out.*

Collaboration. Collaboration on homework is encouraged. Feel free to work with a friend, group, or tutor as you work out solutions to the problems. Your collaboration rights, though, come with two responsibilities:

1. Write up your final solution independently from your collaborators. Copied work is unacceptable.
2. Acknowledge all collaborators and tutors by listing their names at the start of your solution.

Failure to shoulder these responsibilities constitutes an Honor Principle violation and will be dealt with accordingly.

Office hours. Everyone is encouraged to attend office hours. Whenever available, I am happy to discuss curricular and extra-curricular mathematics. This can be an opportunity for you to review confusing material, ask questions about (past, present, and future) homework,[3] or just mull over ideas you find fascinating.

Technology. The use of electronic devices (cell phones, computers, tablets, calculators, *&c*) is strictly prohibited in the classroom without prior authorization from the instructor. That said, legitimate uses of technology (*e.g.*, note-taking) will be accommodated — just talk to me first.

A number of computing resources are available for free online or through Reed. These include the open-source software Sage[4] and proprietary Mathematica.[5] These can be useful tools for visualization and computation, but should be used responsibly. Feel free to check your answers with a computer, but avoid going to the computer first.

Tests and grades. We will have two midterms and a final exam. Your exams, homework, quizzes, and class participation will be taken into account in the determination of your final grade.

Notes.
- Take the date of our final exam into account before making end-of-term travel plans. Accommodations for alternate final exam times will not be made.
- Please contact me as soon as is reasonably possible if you will miss an assignment due to illness or emergency.

One last thing:

> Math is hard, but we're going to get through this together.

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[2]Interested students are encouraged to prepare solutions in the LaTeX document preparation system. A guide to LaTeX resources is available on the course website.

[3]There are no dumb questions, but there are poorly prepared homework questions. Office hours are intended to help you get unstuck — not started — on homework problems. Good office hours questions tend to take the form "I tried X, but it doesn't seem to work because of Y; what can I do?"

[4] http://www.sagemath.org

[5] http://www.reed.edu/cis/help/software/mathematica.html