

MATH 413 SPRING 2008

Note: some of the information in this document has not yet been finalized.

General information Your instructor is Dr. R. Vale, Malott Hall room 583. Can be emailed at rvale@math.cornell.edu. The TA is Ri-Xiang Chen. The class meets TR (that means Tuesday and Thursday) at 0840-0955 in MT (that means Malott Hall) room 203. The webpage is accessible from the Cornell Mathematics Department website and is located at:

<http://www.math.cornell.edu/~rvale/math413.html>

Scope We intend to cover chapters 1 to 7 inclusive of the textbook

Robert Strichartz, *The Way of Analysis* (revised ed.), Jones and Bartlett, 2000 (ISBN: 0-7637-1497-6)

Lecture plan We may not follow this plan very closely (in particular, it would be nice to leave more time to cover Chapter 7) but hopefully it gives a rough idea of what will be taught when.

- Week 1: Revision, proof techniques, cardinality.
- Week 2: Chapter 1 of textbook.
- Week 3-4: Construction and basic algebraic properties of \mathbb{R} .
- Week 5-6: Metric properties of \mathbb{R} .
- Week 6-7: Continuous functions.
- Week 7-8: Definition and basic properties of derivative. *Prelim*
- (Spring Break)
- Week 9: Intermediate Value Theorem, Mean Value Theorem, Rolle's Theorem.
- Week 10: Inverse function and Taylor's theorems.
- Week 11-12: The Riemann integral.
- Week 13-14: Sequences and series (of functions), power series, uniform convergence, equicontinuity if time.

Coursework Tentatively, there will be a weekly homework assignment due on Thursday before the end of the day in my office (put it under the door if I am not there, but I would prefer if you hand it in during class). To earn full credit, your reasoning must be correct and your proofs presented in a clear and rigorous manner. *Homework which is late for any reason will not be accepted.*

There were no homework assignment in week 1 of classes, but some practice questions were be handed out.

Exams and grading There will be a prelim in class on Tuesday 11 March. There will probably be a second prelim after the Spring Break, date TBA. The course grade will be weighted as follows

- Homework 40 %
- Prelims 20 %
- Final 40 %

There may also be occasional quizzes during class. Active participation in class will be taken into account when determining your final grade, but note that you will not be penalized if you sit there silently and choose not to participate!

Academic integrity You are encouraged to discuss the theory and problems from the course with your classmates. However, directly copying from other students is not allowed. You are obliged to abide by the Code of Academic Integrity.

Help and feedback I encourage you to approach me or the TA if anything is unclear. Questions affecting a sizeable part of the class will be discussed in the lecture. I will welcome any feedback you have about my teaching or any concerns about the course. If there is anything that you feel can be improved (eg. the lecturer is standing in front of the blackboard and it is hard to take notes) it is much better to discuss it during the course than to wait until the end!