Instructor: Prof. Thomas Vogel
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Course homepage: www.math.tamu.edu/~tvogel/410.html. There will be many useful things posted on this page including assignments and all material handed out in class.
Office hours: M-Th, 2:00-3:00, F 3:00-4:00, or by appointment (talk to me after class). Just dropping in is okay, too, although I can’t guarantee that I’ll be there outside of my office hours. If you’re running into problems, the sooner you come by and get them fixed, the happier we’ll both be. I often keep my office door closed, because the hallway outside can get noisy. That doesn’t mean I’m not glad to see students: just knock.

Text: An Introduction to Analysis, by Wade.

Prerequisites: Math 323 or equivalent (Linear Algebra), and Math 409 or equivalent (first semester advanced calculus). If you don’t satisfy these prerequisites, you should not be in this course.

Course content: Series of numbers and functions, topology of \( \mathbb{R}^n \), differential calculus of functions defined on \( \mathbb{R}^n \), including the implicit and inverse function theorems. More specifically, a quick review of chapter 6, then chapters 7–9, 11 of Wade’s book, and as much of chapter 12 as we have time for.

Course objectives: If a student successfully completes this course, I expect that they can do the following.

- **Chapter 6**
  - Explain the relationship between a series and the sequence of its partial sums.
  - Explicitly sum telescoping and geometric series.
  - Apply standard convergence tests to series.

- **Chapter 7**
  - Explain and apply the concepts of pointwise and uniform convergence of sequences and series of functions.
  - Be able to prove and apply the Weierstrass M-test.
  - Find intervals of convergence of power series, and explain the behavior inside the interval of convergence.
  - Explain what an analytic function is.
  - Find Taylor series of functions and bound the remainder term in the series.
• Chapter 8
  – Explain and apply concepts in the topology of $\mathbb{R}^n$.
• Chapter 9
  – Explain and apply convergence of sequences in $\mathbb{R}^n$, and the relationship to topological concepts.
  – Explain and apply concepts of limits of functions in $\mathbb{R}^n$ and continuous functions in $\mathbb{R}^n$.
• Chapter 11
  – Explain the definition of differentiability of functions in $\mathbb{R}^n$, directional derivatives, differentials.
  – Explain and apply the chain rule in $\mathbb{R}^n$, the Mean Value Theorem in $\mathbb{R}^n$, Taylor’s formula in $\mathbb{R}^n$.
  – Explain and apply the Inverse Function Theorem and the Implicit Function Theorem.
• Chapter 12
  – Explain and apply the definitions of Reimann integral on a box in $\mathbb{R}^n$, and a Jordan region in $\mathbb{R}^n$.

Grading:
  3 tests, 100 points each for 300 pts.
  Final exam 200 pts.
  Homework 100 pts.

Final grade:
  540–600 = A
  480–539 = B
  420–479 = C
  360–419 = D
  0–359 = F

(I have been known to curve final grades if I feel that it is warranted.)

Homework: Homework will be due on Fridays by 4 pm, except for weeks during which there is a test. Late homework that is a week or less late will have 20% deducted. Homework that is more than a week late will not be accepted. Your lowest homework score will be dropped and a percentage computed from the rest in determining the homework portion of your final grade (i.e., homework points may not equal test points). Discussing homework with me or your classmates is okay, but passing off someone else’s work as your own is plagiarism (this includes copying from a solutions manual), and is a violation of the Aggie Honor Code.

Where to go for help: I’m always glad to help students during my office hours (That’s what they’re there for!), and other times by appointment. Also, the math department keeps a list of tutors (ask at one of the department offices.
either 6th floor of Blocker or 1st floor of Milner), although there might not be many who are able to tutor for this class.

**Tests:** Tests will be given on 2/17, 3/23, and 4/20 with reviews to be given on the previous Tuesday evenings with locations and times to be announced. The sections covered on a test will be announced well before the test is given. Complaints about test or homework grades must be made within two weeks of when the material is returned to the class. Beyond that time, the grade will not be changed. If you must miss a test due to a University excused absence (see http://student-rules.tamu.edu/rule07) notify me before the test if possible, but at the latest by the end of the second working day following the absence. Otherwise I'm under no obligation to write a make-up exam. **Lowest grade:** I will give you a break on your lowest test grade if you show me that you understand the corresponding material on the final. Specifically, I will find your lowest test grade and compute the percentage of points obtained on questions on the final related to your lowest test. If that percentage is higher than your grade on the hour exam, I'll raise the grade on your lowest test, but no higher than your second lowest test grade. This is designed specifically to help the student who does well on two of the hour exams, but not so well on the third. If you do badly on two exams, you're on your own.

**Schedule:** My plan is the following: 1 1/2 weeks on chapter 6, 2 1/2 weeks on chapter 7, two weeks on chapter 8 (postpone section 8.2), 3 1/2 weeks on chapter 9, four weeks on chapter 11 (and section 8.2), a few lectures on chapter 12. This may be adjusted slightly during the semester.

**Copyright:** The handouts for this course are copyrighted. You have permission to make single copies for personal use, but multiple copies are not allowed without my express written permission.

**Disabilities:** The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe that you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, room B118, e-mail them at disability@tamu.edu, or go to their website at http://disability.tamu.edu for more information.

**Academic integrity:** An Aggie does not lie, cheat, or steal, or tolerate those who do. I take academic dishonesty quite seriously, and will prosecute any violation of the Aggie honor code that I think I can prove. For more information on the honor code, please refer to http://www.tamu.edu/aggiehonor.

**Bluebooks:** Please turn in to me four 8 1/2 by 11 blank bluebooks (not even your name on them) before the day of the first exam.

The final exam is Friday, May 4th, from 3 pm to 5 pm, in our regular classroom.