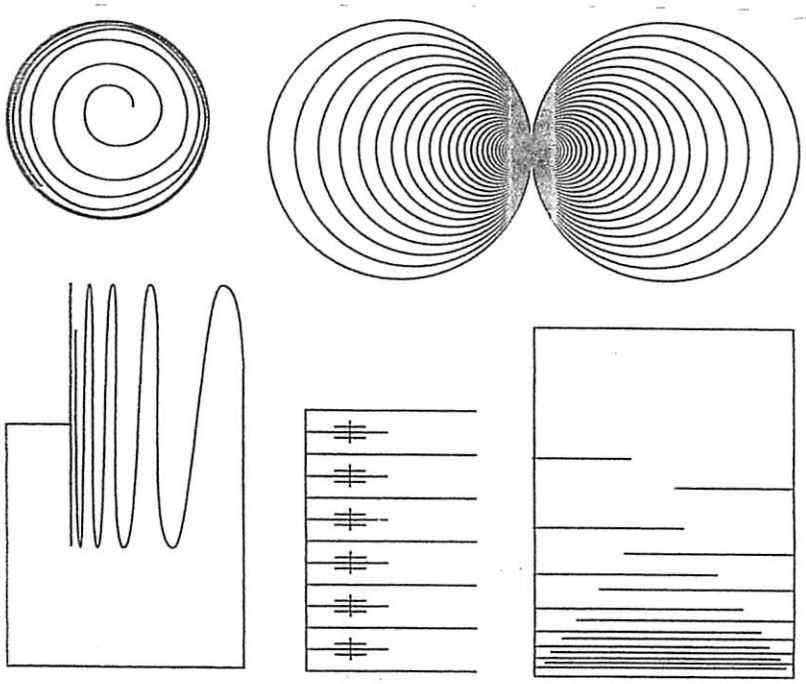
Mathematics 131

Mathematical Analysis I



Time and Place: T & R 1:15 – 2:30 pm, RN 105. Spring 2012

Instructor: Asuman Guven Aksoy

Office: Adams 215, Campus x72769 Off-Campus: dial 607-2769

Email: aaksoy@mckenna.edu;

http://www.asumanaksoy.com

Office Hours: T & R 11:00 am – 12:00 and by appointment.

Text: *Elementary Classical Analysis* (2nd edition) – J.E. Marsden, M. Hoffman

A Problem Book in Real Analysis- A.G. Aksoy and M.A. Khamsi

Prerequisites: Math 60 Linear Algebra

References:

I. The number of books on advanced calculus and introductory analysis is overwhelming. Despite the large number of recent texts, some of the older books remain the best. Some favorites are:

Apostol, T.M., 1974. *Mathematical Analysis*, 2nd ed., Reading, Mass: Addison-Wesley.

Bartle, R.G., 1976. *Elements of Real Analysis,* 2nd ed., New York: Wiley.

Buck, R.C., 1965. *Advanced Calculus,* 2nd ed., New York: McGraw Hill

Lang, S., 1968. *Analysis I,* Reading, Mass: Addison-Wesley.

Rosenlicht, M., 1968. *Introduction to Analysis,* Glenview III: Scott, Foresman and Co.

Rudin, W., 1976. *Principles of Mathematical Analysis*, 3rd ed., New York: McGraw Hill.

Diedonne, J., 1966. *Foundations of Modern Analysis,* New Jersey: Prentice-Hall.

Halmos, P.R., 1960. *Naïve Set Theory,* New York: Springer-Verlag.

Simmons, G. f., *Introduction to Topology and Modern Analysis*, McGraw Hill, New York, 1963

II. Some recent texts are:

Wade, W.R., *Introduction to Analysis*, Prentice-Hall, NJ, 2000

Abott, S., *Understanding Analysis*, Springer UTM, NY, 2001

Pugh, C. *Real Mathematical Analysis,* UTM, NY, 2002

Davidson, K. R., Donsing A.P., *Real Analysis with Real Applications,* Prentice Hall, NJ, 2002

Beals, R., *Analysis: An Introduction,* Cambridge University Press, Cambridge, 2004.

Exams:

- 2 Midterms Exams on February 23rd and April 10th.
- Homework, Weekly, generally due on Thursdays

Comprehensive **Final Exam**, Friday May 11th at 2:00 pm

There will be NO make-ups for any exams unless there is a very good reason.

Grading Scheme:

Final grade is computed as follows:
Homework: 20 %, Midterm I: 25 %, Midterm II: 25 %, Final Exam: 30%.

Class Participation and Homework:

One of the goals of this course is that you learn the art of mathematical proofs. I expect frequent suggestions and questions during lectures. Homework will be assigned regularly and you may work with each other (unless otherwise is instructed) but **you must write up your own answers.**

Topics:

1. Sets and functions
2. Countable sets and cardinality
3. Sequences, subsequences, liminf, limsup
4. Cauchy sequences, completeness
5. Metric and norms, metric spaces
6. The topology of the metric spaces
7. Compactness and connectedness
8. Continuity, uniform continuity
9. Sequences and series of functions, uniform convergence
10. Sets of measure zero, integration
11. Some fixed point theorems

Comments:

This is a course in which the material you saw in Calculus is put on a solid mathematical basis. For some of you it will be the first course in which you are expected not to calculate answers, but to give proofs. The transition, though intellectually exciting, is difficult for many students. Students who think they will have particular difficulty with proofs are advised to work harder and meet with the professor and tutors during as early in the semester as possible.

Homework Grader:

Xun Sun, CGU
e-mail: foxfur_32@hotmail.com

Tutoring:

Tutoring will be held in the Math Commons Room on Sunday through Thursdays from 8:00-10:00 pm. Tutors assigned for this course are:

William Dodds , CMC, e-mail: wdodds13@cmc.edu
Nathan Lenssen, CMC, e-mail: nlenssen13@cmc.edu

Math Commons Room is located at 208 Adams Hall-down the hall from Poppa lab.