

Prerequisite MATH 237, MATH 307, and MATH 310, with grades of C or better.

Professor Dr. David K. Neal COHH 4108 745-6213 david.neal@wku.edu

Office Hrs MW 10:40 – 11:20; TR 11:45 – 12:40; or by appointment.

Course Description **MATH 337** is an introduction to the concepts of real analysis. The course covers standard material on the real number system, metric spaces, limits, sequences, functions, and continuity. Material on differentiation, series, integration, and sequences and series of functions is now covered in MATH 431.

Text No text is required. Course notes will be provided in pdf format at <http://people.wku.edu/david.neal/337/>

Standard texts on Real Analysis or Advanced Calculus can be used for further reference.

Homework

Exercises will be assigned daily with some problems to be turned in for a grade. On these problems, students are expected to do their own work; plagiarism and allowing plagiarism are not allowed and will result in a grade of 0 for the assignment. A repeat offense will result in the offending students being dismissed from the class. Late homework will not be accepted for credit.

All problems will require you to write a proper mathematical proof. All proofs should be written elegantly and neatly in a formal mathematical style. Complete sentences of explanation are required. Do not simply write an equation; you must explain what the equation is giving and/or why it is being used. Moreover, all equations must be properly inset and aligned with no scratch outs.

Tests

Each test will be based on class lectures and assigned homework. The tests will be closed-book with no formula sheets allowed and no calculators allowed. Details of the tests will be outlined well in advance of the tests. The tests will be precisely as I outline them, with nearly all test questions *given to you in advance*. Therefore, I absolutely expect you to learn this material with no exceptions and no excuses.

Tentative Test Dates

Test 1: Thurs Sep 18

Test 2: Thurs Oct 16

Test 3: Tues Nov 11

Final Exam: Wednesday Dec 10 1:00 – 3:00

Attendance Policy

Registration in this course obligates you to be regular and punctual in class attendance. However you may attend or not attend, as you desire. If you attend class, then please be attentive and respectful. If you ever choose not to attend class, then you should not expect to receive a passing grade because it is my judgement that, at this level, even average students of mathematics attend each class. Therefore if you skip class, then I will consider you to be below average and not worthy of receiving a passing grade in analysis.

Make-Up Policy

Students are expected to take all tests in class when they are scheduled. I will not accommodate requests to re-schedule exams for students who wish to skip class to go do other activities. But if you must miss an exam due to a documented medical cause or tragedy, such as a heart attack, stroke, burst appendix, seizure, coma, broken femur, childbirth, earthquake, tornado, polar vortex, car wreck, kidnapping, spontaneous combustion, campus lockdown, etc., then I may consider giving you a make-up.

Grading Policy

In order to receive a passing grade for this class, you must demonstrate that you have learned the material and that you have learned it well. For students who attend each class, grades will be weighted as follows:

Assignments: 20%

Three Tests: 20% each

Final Exam: 20%

A: Average $\geq 95\%$
(Excellent)

B: $87.5\% \leq \text{Avg} < 95\%$
(Good)

C: $80\% \leq \text{Avg} < 87.5\%$
(Average)

F: Avg $< 80\%$
(Failure)

At my discretion, there may be a slight curve to this grading scale.

Withdrawal Date

October 15, 2014 is the *last* day to withdraw from the course with a grade of W or to change enrollment from credit to audit. But you may withdraw from the class any time you like before this date.

Disability Services

Students with disabilities who require accommodations, academic adjustments, and/or auxiliary aids or services for this course must contact the Office for Student Disability Services in DUC A-200. The OFSDS telephone number is 745-5004 (or 745-3030 TTY). Please do not request accommodations directly from the professor without a letter of accommodation from the Office for Student Disability Services.

Learning Outcomes

Successful students will show proficiency in writing detailed solutions to analysis problems, learning and writing formal analysis definitions, and learning and writing proofs to analysis theorems on topics that include

- (i) Ordered sets; the real number line; infimums and supremums
- (ii) Metric spaces including open, closed, and bounded sets
- (iii) Limits and convergence of sequences within metric spaces and on the real line
- (iv) Limits and continuity of functions within metric spaces and on the real line
- (v) Cardinality; denumerable and uncountable sets