

## MAD 4211 (3045) Advanced Calculus

Fall 2017

<http://people.clas.ufl.edu/kees/files/MAA4211Fall2017.jpg>

**Instructor:** James Keesling (352) 294-2312  
LIT 424  
[kees@ufl.edu](mailto:kees@ufl.edu)

**Office Hours:** MW 6-Period  
**Class Time:** MWF 7-Period, 1:55-2:45 pm  
LIT 217

**Textbook:** *Understanding Analysis* (Springer, 2<sup>nd</sup> Edition, Stephen Abbot, 2015). References: *Analysis by Its History* (Springer, E. Hairer and G. Wanner, 1995). *Introduction to Analysis* by Maxwell Rosenlicht (1968, Dover, 1986).

**Required calculator:** A **TI-Nspire CX CAS** calculator is required. The manual can be found at <http://education.ti.com/en/us/guidebook/search/ti-nspire>.

**Goal:** The student will become familiar with familiar with the techniques of advanced analysis and proofs of the main results.

**Syllabus:** This course is a two-semester introduction to the basic techniques of analysis. The material to be covered follows: set theory, the real number system, metric spaces, continuous functions, differentiation, Riemann integration, interchange of limit operations, the fixed point theory, implicit function theorem, solutions of differential equations, partial differentiation, multiple integrals.

In addition to covering the principles of analysis and the main proofs, the course will also introduce some applications, methods of calculating using the theory, and some of the historical development of its ideas. For the purpose of calculation, the students are required to have a **TI-Nspire CX CAS** calculator. No other calculator is acceptable. Programs will be available online to download. The calculator will be used for examples in class and must be available for class exams.

The material to be covered this semester is the following.

Week 1	Set theory and the real number system
Week 2-4	Metric spaces and continuous functions
Week 5	Sharkovski's Theorem and chaos
Week 6-7	Differentiation
Week 8-10	Riemann integration
Week 11-12	Interchange of limit operations
Week 13-14	Fixed Point Theory
Week 15-16	Review

**Tests and Grading:** There will be two in-class tests and a final exam. The grades will be determined by averaging the tests and final exam scores: 95-100 = A, 90-94 = A-, 87-89 = B+, 83-86 = B, 80-82 = B-, 76-79 = C+, 70-75 = C, 65-69 = D+, 60-64 = D, 0-59 = E.

**Final Exam:** Thurs, Dec 14, 10:00 am-12:00 pm, LIT 217

**Policy for Make-Up Exams:** If a student has a known conflict for an exam, the student has the responsibility to make arrangements for a make-up before the exam is given. If a student misses an exam due to an emergency, arrangements must be made as soon as possible for a make-up.

**Students with Disabilities:** Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)) by providing appropriate documentation. Once registered, students will receive an accommodation letter that must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.