

Spring 2018

Mat 372 — Advanced Calculus II

Line No. 22937
Time TuTh 9:00-10:15 AM
Room WXMLR A308
Instructor Jack Spielberg
Text Robert Bartle, *Elements of Real Analysis*

Prerequisite MAT 371
Corequisite MAT 342 or 343

This is the continuation of Advanced Calculus I (MAT 371). While 371 develops the theory of one-variable calculus, in this course we will study functions in several variables, i.e. analysis in n -dimensional Euclidean space. There is a huge difference between $\mathbb{R} = \mathbb{R}^1$ and \mathbb{R}^n , and this plays out in the much subtler multivariable versions of many straightforward results from one-variable analysis. We will begin with a deeper look at the topology of \mathbb{R}^n than is usually given to \mathbb{R} in the previous semester, including careful treatments of compactness and connectedness, continuity, and uniform convergence. The bulk of the course will be devoted to differentiation and integration in \mathbb{R}^n , with careful treatments of the inverse and implicit function theorems for differentiable functions, and of the Fubini and change of variable theorems for integrable functions. It is here that linear algebra will be used as a crucial tool for understanding analysis. If there is time remaining there is a choice of additional topics, such as a deeper look at infinite series and power series, or possibly a brief treatment of the theorems of vector calculus.

The most important part of the course is the weekly homework. However there will also be a midterm exam, and a cumulative final exam.

Questions should be addressed to the instructor at jack.spielberg@asu.edu.