

MATH740, Spring 2019

General information for Tamás Darvas' students

Instructor: Tamás Darvas, tdarvas@math.umd.edu.

Grader: Stephen Gilles, sgilles@math.umd.edu.

Course Website: www.math.umd.edu/~tdarvas/teaching.html.

Email: tdarvas@math.umd.edu. Be sure to include "Math 740" in the subject line.

Class: TTh 2:00 PM - 3:15 PM, MTH B0431.

Office hours: TTh 1:00 PM - 2:00 PM, (in my office MTH 4416), and by appointment.

Syllabus: This course will be a basic graduate introduction to differential geometry. We will start with some foundational material: defining manifolds, tangent bundle, vector bundles, the inverse and implicit function theorems, immersions and submersions, submanifolds, ideas of transversality. Then we will cover differential forms, integration on manifolds, Stokes' Theorem, and time permitting de Rham cohomology. After that we will get to Riemannian geometry. We will introduce and study Riemannian metrics, connections, geodesics, curvature, Jacobi fields, and the geometry of submanifolds. At the end we will try to cover some of the main classical theorems in global Riemannian geometry, which relate curvature properties to topology, such as the Cartan-Hadamard Theorem and Myers' Theorem.

Textbook: for the first part of the course the reference is John M Lee: *Introduction to Smooth Manifolds*, 2nd ed. For the second part of the course the reference is John M Lee: *Riemannian Manifolds*, 2nd ed.

Assignments: around 10-12 homework assignments which will amount to 50% of your grade. Assignments are due in one week, in class. No late homework will be accepted out of consideration to the grader. If you have questions about homework grading policy please address them to the grader directly. There will be a take home midterm (date TBD) and a comprehensive in class final exam. The midterm will amount to 20% and the comprehensive Final will amount to 30% of your grade.

Prerequisites: good command of point set topology and real analysis at the graduate level.

Absences: Absence for medical reasons on days when exams are scheduled requires documentation of the illness, signed by a health care professional.

Academic integrity: The University has a nationally recognized Honor Code, administered by the Student Honor Council. The pledge, approved by the University Senate, reads: "I pledge on my honor that I have not given or received any unauthorized assistance on this assignment/examination." Unless specifically advised to the contrary, the Pledge should be handwritten and signed on all tests in this course. In conjunction with the University's Code of Academic Integrity, allegations of academic dishonesty will be reported to the Honor Council.