

Math 433: Introduction to Differential Geometry – Winter 2019

Instructor: Jun Li

Office: EH 4839

Class schedule:

Email:lijungeo@umich.edu

Office Hours:

- MWF 11:00 - 11:50 (EH4088)

- MWF 11:50-12:50pm

Text: Differential Geometry of Curves and Surfaces by Manfredo Perdigao do Carmo.

DISCLAIMER: : This syllabus is not necessarily what exactly is going to happen in this class. I feel that in this case the journey is equally (if not more!) important than the destination itself, and so some flexibility should be essential in targeting the material to YOUR taste, pace, and interests. I strongly encourage continuous feedback and input on the course; and I reserve the right of making the final decisions.

Course description: Differential geometry is the study of geometric properties of curves, surfaces, and their higher dimensional analogues using the methods of calculus and linear algebra. It is a vast and beautiful subject, which has rich connections with various other branches of mathematics, as well as many applications in various physical sciences, e.g., solid mechanics, computer tomography, and general relativity. Emphasis will be placed on developing intuition and learning to use calculations to verify and prove theorems. Students need a good background in multi-variable calculus (215) and linear algebra (preferably 217).

Contents: The first several weeks will be on curves, mostly to prepare our study of surfaces which will be the primary topic for the rest of the semester. Regarding surfaces, we will define and study properties which are intrinsic to the geometry of surfaces in the sense that they only depend on how distance is measured. Most of the properties will be local in nature (e.g. curvature) but we will eventually come to the Gauss-Bonnet Theorem which relates those local properties to global characteristics of the surface. At the end of the semester, we will cover some additional topics such as hyperbolic geometry, Riemann surfaces, and general manifolds. Your idea on what you want to know is strongly encouraged.

Course Website: We will make the all the material available on Canvas.

Homework: There are approximately ten homework assignments. Problem sets and deadlines will be posted on Canvas. Working on the problem sets with your classmates will be strongly encouraged. However, anything you turn in with your name needs to be your own work and your own word. Homework will count 30% of the total grade.

Grader : Paulina Czarnecki, **Email:**pczarn@umich.edu

Exams There will be 2 in-class midterm exams and 1 final exam. One works on oneself in Exams.

Exams dates, time and weights:

First Exam (20%):	Wednesday, February 20	11:00 - 11:50 (EH4088).
Second Exam (20%):	Wednesday, Apr 3	11:00 - 11:50 (EH4088).
Final Exam (30%):	Monday, April 29,	4 pm (sharp) - 6 pm (EH4088).

Grading Policy: 30% HW + 2 × 20% Midterm + 30% Final = 100% total.

Academic Integrity: According to the *LSA Community Standards of Academic Integrity*, the College “prohibits all forms of academic dishonesty and misconduct. ” You are encouraged to discuss homework problems, but **you must write up your solution independently**. Do NOT cheat in exams. If you cheat in this class, you risk failing the course. If you have any questions about what is, or is not, allowed in this course, please ask.

Accommodations: If you think you need an accommodation for any reason(athletic, extracurricular, religious, or personal reasons), please let me know as soon as possible. Proper documentation must be provided to me at least two weeks prior to the need for a exam accommodation.

Enjoy this class!