

285G/1, Fall 2016.

Dr. W. Gangbo *

September 20, 2016

General facts. Mathematics 285G/1 will meet M W F from 2:00 to 2:50 pm in 5148 MS. This course focuses on the analysis of a collection of problems centered around a transportation problem — which in the latter case comes into play whenever the dynamics conserve a scalar locally. The course will be based on the textbook by Ambrosio, Gigli & Savaré, *Gradient Flows in Metric Spaces and in the Space of Probability Measures*. There, we will start with the needed preliminary results on measure theory. We will study the optimal transportation problems, their dual, the Wasserstein space and the weak Riemannian structure on the set of probability measures of finite second moments. We will show how to obtain geometric and functional inequalities by applying elementary results of optimal mass transportation theory. As time permits we will talk about the connection between optimal mass transportation theory and various concepts of geometric curvatures. Please read the sections of the notes as they are taken up in class and browse the relevant parts of the text. There will be regular assignments of homework problems which will not be collected and can be found at

www.math.gatech.edu/~gangbo

Office hours. My office is 7945 MS and my office hours will be M W F from 1:00 to 2:00 pm, or by appointment. I may be reached by phone at (310) 825-4245 or email at wgangbo@math.ucla.edu.

Grades. The course grade for Mathematics 285G/1 will be based on a take-home exam and a 25mn class presentation. The tentative date for the take-home exams is the week of November 06 - 10. The tentative date for the class presentation exams is the week of November 27 - December 01. These various items will be weighted according to

Takehome Exam	50 %
Class Presentation	50 %

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