

Course Description: The calculus of variations is concerned with finding optimal solutions (shapes, functions, etc.) where optimality is measured by minimizing a functional (usually an integral involving the unknown functions) possibly with constraints. This course is an introduction to the classic ideas and techniques of the calculus of variations, with emphasis on its applications in several scientific fields. Isoperimetric problems, the Hamilton-Jacobi differential equation, eigenvalue eigenfunction problems for the vibrating string/membrane will be among the subjects of investigation of this course.

Website: <http://www.math.ubc.ca/~khosravi/MATH.402.2017/>

Instructor: Prof. Mahta Khosravi, Department of Mathematics, UBC

Office Hours: M W F, 12:00 p.m.—1:00 p.m. (MATH 219) or by appointment.

Time and Location of Math 402 sec 201: M W F 11:00 a.m.—12:00 p.m. in MATH 202.

Pre-requisites: A score of 68% or higher in one of MATH 301, MATH 320.

Text: “Calculus of variations” by I. M. Gelfand and S. V. Fomin. Chapters I-VI.

Homework and Exams: Homework problems will be posted regularly on the course website. In addition, there will be a final and a course project. Your total score will be a weighted average of your homework, project and final scores, with breakdown as follows:

50% on the Homework

20% on Projects

30% on the Final Exam.