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M 512.01: Integral Equations

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Math 512: **Introduction to Integral Equations**
Spring 2014

Course Instructors / Information: You may contact the instructor for help during his office hours:

Name	Office	Hours	Phone	Email
Peter Golubtsov	Math 213	M,W,F 12-1	243-5562	peter.golubtsov@umontana.edu

Course Format: 3 credits; MWF 11:10 a.m. – noon / MATH 306. The lectures will be videotaped and posted on the web.

Web page: http://www.math.umt.edu/golubtsov/IE_2014_S/
Will also be accessible from http://www.umt.edu/math/classes/

Prerequisites: Consent of instructor. Most of the required material will be given in the course, but familiarity with Linear Algebra and Ordinary Differential Equations would be helpful.

Text: Lecture notes and handouts. Auxiliary book (not required): Hochstadt, H., *Integral equations*, Wiley, 1973.

Course Goals: The main goal of this course is to introduce fundamental concepts and results of integral equations without going too deep into functional analysis. We will start with some basic notions of functional analysis which, although quite simple, are essential for understanding the subsequent material. Then we will study the linear Fredholm and Volterra integral equations of the second kind and some related topics, such as the Hilbert-Schmidt theorem, Fixed Point theorems, Fredholm Alternative, and application to the Sturm-Liouville Eigenvalue Problems. Finally, in the last few lectures, we will study the regularization method for ill-posed problems for the Fredholm integral equation of the first kind.

Grading: Several homework assignments will be given during the semester (30% of final grade); there will be one midterm (30% of final grade), and a **final exam** during the finals week (30% of final grade). All the tests are take home. Most of the material will only be given in class, so the attendance is very important for understanding of the course material. Thus, the course will also be based on attendance (10% of the final grade).

Tentative grading intervals:
A: [85%, 100%]; B: [70%, 85%); C: [55%, 70%); D: [40%, 55%); F: [0%, 40%).

Incomplete (I) Grades: Incompletes (I's) are given at the discretion of the course instructors. See online UM catalog for the conditions under which an "I" may be given.

Credit/No-Credit Grades: A D- grade is required to receive credit under the Credit/No-Credit option. You can change your grading option from Credit/No Credit to Traditional or vice versa on Cyberbear until February 14. You will not be allowed to change your grading option from Credit/No Credit to Traditional or vice versa starting May 10 under **ANY** circumstances. See online UM catalog for more information.

Adding/Dropping the Course: The last day to add this course through Cyberbear is February 4. The last day to drop this course or change the grading option through Cyberbear is February 14. Between February 5 and February 14 you can add a course using registration override with instructor's signature. Between February 15 and May 9 you can add / drop a course or change the grading option with a drop/add form with your advisor's / instructor's signature and $10.00 fee. Starting on May 10 dropping the course may only be done through the university petition process in cases of registration error. See online UM catalog for more information.

Academic Misconduct: All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at http://life.umt.edu/vpsa/student_conduct.php.

Disability Services: The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with DSS, please contact DSS in Lommasson 154. We will work with you and DSS to provide an appropriate accommodation.