MAT367 - Differential Geometry

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Office Hours	Friday, 2:30-3:30

Course Description

Manifolds, partitions of unity, submersions and immersions, vector fields, vector bundles, tangent and cotangent bundles, foliations and Frobenius' theorem, multilinear algebra, differential forms, Stokes' theorem, Poincaré-Hopf theorem.

Textbook. No required textbook; lecture notes will be provided.
Suggested reference: William M. Boothby, An introduction to differentiable manifolds and Riemannian geometry, Academic Press.

Course Website. The website for the course is

`http://www.math.toronto.edu/mgualt/courses/18-367`

Homework Assignments

There will be 6 assignments, which you will receive via Crowdmark. The solutions are to be submitted electronically, using crowdmark. This means that you will receive a personalized link from crowdmark (not to be shared), with instructions for uploading the solution. It can be a jpeg file (e.g., take picture with your cellphone) or pdf file (e.g., scan your handwritten file, or use LaTeX to create the file). Our late policy is as follows: **No late assignments will be accepted.**
Note: You must write your solutions yourself, in your own words. If your solution is aided by information from textbooks or online sources, you must properly quote these references.

Term Tests

There will be 2 term tests, taking place during class time. See the course schedule below for dates and location for each term test. More details about the term test will be given later. You must bring your student card to each term test. No aids will be allowed.

Missing Term Work

If you cannot show up for a test because of illness or any other special reason, you MUST submit the official UofT medical certificate, which can be downloaded from this link:

`http://www.illnessverification.utoronto.ca`

There will be NO make-up tests. The marking scheme will be adjusted appropriately for students who have missed a test because of illness or any other (approved) legitimate reason.

Final Exam

The final exam will take place during the examination period, and will be 3h long. it will cover all the material presented in the lectures.
Aids permitted: None

Marking Scheme

Your final grade is determined in the following way:

Homework	(best 5 out of 6)	20 %
Term Test 1	02/25/2015	20 %
Term Test 2	03/23/2015	20 %
Final Exam		40 %
		100 %

Code of Behaviour / Plagiarism

Students should become familiar with and are expected to adhere to the Code of Behaviour on Academic Matters which can be found at:

`http://www.governingcouncil.utoronto.ca/policies/behaveac.htm`

Course Outline

The following is a **tentative** outline of the material which will be covered.

Week	**Dates**	**Topics**
0	Jan 5	Informal intro
1	Jan 8 - Jan 12	Definition of manifolds
2	Jan 15 - Jan 19	Examples of manifolds
3	Jan 22 - Jan 26	Smooth maps, submanifolds
4	Jan 29 - Feb 2	Tangent vectors, tangent maps
5	Feb 5 - Feb 9	Submersions, immersions
6	Feb 12 - Feb 16	Vector fields and flows, tangent bundle
7	Feb 19 - Feb 23	**Reading week – no classes**
8	Feb 26	Term test 1
	Feb 28 - Mar 2	Lie brackets
9	Mar 5 - Mar 9	Frobenius' Theorem
10	Mar 12 - Mar 16	Differential forms
11	Mar 19 - Mar 23	Cartan calculus
12	Mar 26	Term Test 2
	Mar 28- Mar 30	Applications of differential forms
13	Apr 2 - Apr 4	Integration, Stokes' theorem