Calculus of Several Variables

MATH 4013

Time and Place: MWF 11:30-12:20 in HES 316
Professor: Igor E. Pritsker
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Textbook: *Vector Calculus*, by J. E. Marsden and A. J. Tromba, W. H. Freeman and Co, 5th Ed.

Grading: There will be three semester tests and the Final Exam. The break up of your course grade is as follows:

Tests 1-3	60% (20% each)
Quizzes	10%
Final Exam	30%

Your grade will be determined according to the scale

A	90-100
B	80-89
C	70-79
D	60-69
F	59 and lower

Note that the above numbers are percentages of the highest possible score in the course.

Quizzes: Be prepared for short quizzes (1-2 problems, about 10 minutes).

Homework will be assigned on a daily basis (see the schedule) and may be collected periodically. It is required that you complete all homework.

Make-up Exams are given only in cases of serious illness or extreme emergency that prevents you from taking a test at the specified time. You have to contact me before the test and communicate all circumstances. Furthermore, you must appear in person, with supporting documents, to discuss the situation as soon as possible.

Technology: You will find that mathematical software is very useful for visualization and computations in this course. Any of the following packages is sufficient for our purposes: *Maple*, *Mathematica* or *MATLAB*.

Brief Schedule

Chapter 1	Chapter 3	Chapter 5	Chapter 7
Chapter 2	Chapter 4	Chapter 6	Chapter 8
Test 1	Test 2	Test 3	Final Exam

University Syllabus Attachment: Contains drop deadlines and procedures, as well as many other important dates and university policies.

Note: The homework problems below are to be assumed odd numbered, unless it is indicated otherwise.

Detailed Schedule

Week	Date	Sec	Page	Topic	Homework
1	M, Jan 10	1.1	1	Vectors in 2 and 3 dimensional space	5-9, 13-23, 24
	W, Jan 12	1.2	23	The inner product, length and distance	3-9, 15-21, 25
	F, Jan 14	1.3	38	Matrices, determinants and the cross product	3-11, 15, 25-29
2	M, Jan 17	Martin Luther King Jr. Day			
	W, Jan 19	1.4	65	Cylindrical and spherical coordinates	1-9
	F, Jan 21	1.5	74	n-Dimensional Euclidean space	5-13
3	M, Jan 24	2.1	94	The geometry of real-valued functions	7-17, 23-27
	W, Jan 26	2.2	107	Limits and continuity	1, 5-17
	F, Jan 28	2.3	127	Differentiation	3-17
4	M, Jan 31	2.4	141	Introduction to paths	5-9, 13-17
	W, Feb 2	2.5	150	Properties of the derivative	1-9, 13-15
	F, Feb 4	2.6	163	Gradients and directional derivatives	3-5, 9-15
5	M, Feb 7	Test 1			
	W, Feb 9	3.1	182	Iterated partial derivatives	1-11
	F, Feb 11	3.2	193	Taylor's theorem	1-5
6	M, Feb 14	3.3	203	Extrema of real-valued functions	1-9, 17, 29-33
	W, Feb 16	3.3	203	Extrema of real-valued functions	1-9, 17, 29-33
	F, Feb 18	3.4	225	Constrained extrema and Lagrange multipliers	1-13, 21
7	M, Feb 21	3.4	225	Constrained extrema and Lagrange multipliers	1-13, 21
	W, Feb 23	4.1	261	Acceleration and Newton's second law	1-7
	F, Feb 25	4.2	274	Arc length	1-9
8	M, Feb 28	7.1	421	The path integral	1-7
	W, Mar 2	4.3	285	Vector fields	5-15
	F, Mar 4	4.4	294	Divergence and curl	7-17, 23-25
9	M, Mar 7	Test 2			
	W, Mar 9	5.1	317	Introduction	1-3, 7-11
	F, Mar 11	5.2	327	The double integral over a rectangle	1-7, 11
10	Mar 12-20	Spring Break			
11	M, Mar 21	5.3	341	The double integral over more general regions	1-11
	W, Mar 23	5.4	349	Changing the order of integration	1-9
	F, Mar 25	5.6	354	The triple integral	3-9, 13-17, 23-25
12	M, Mar 28	6.1	369	The geometry of maps from R^2 to R^2	1-9
	W, Mar 30	6.2	376	The change of variables theorem	1-5, 13-19, 23, 31
	F, Apr 1	6.3	393	Applications of double and triple integrals	1-5, 9-13
13	M, Apr 4	Test 3			
	W, Apr 6	7.2	429	Line integrals	1-11, 15
	F, Apr 8	7.3	451	Parametrized surfaces	1-11
14	M, Apr 11	7.4	461	Area of a surface	1-5, 11-15

	W, Apr 13	7.5	474	Integrals of scalar functions over surfaces	1-11
	F, Apr 15	7.6	483	Surface integrals of vector fields	1-11
15	M, Apr 18	8.1	518	Green's theorem	3-13
	W, Apr 20	8.2	532	Stokes' theorem	3-11
	F, Apr 22	8.3	550	Conservative fields	1-9, 13, 15
16	M, Apr 25	8.4	561	Gauss' theorem	1-9
	W, Apr 27	Final Review			
	F, Apr 29	Final Review			
17	F, May 6	**Final Exam (HES 316, 10-11:50 a.m.)**			