

**Class Times and Place:**

2210-006, MWF, 9:40-10:30, JFB 102

2210-003, MWF, 10:45-11:35, JFB 102

**Instructor:** Ken Golden, Distinguished Professor of Mathematics

LCB 328, 801-581-6176 (office), 801-750-8555 (mobile)

kenatmath@gmail.com, golden@math.utah.edu

website: [www.math.utah.edu/~golden](http://www.math.utah.edu/~golden)**Office Hours:** Mondays 11:45 AM - 12:45 PM, by appointment, or most days after class. There will be a practice exam and review session to go over it before each exam.**Text:** *Calculus with Differential Equations, 9th Edition*, Varberg, Purcell and Rigdon**Course Materials:** Practice exams, the syllabus, help schedules, etc. can be obtained at [www.math.utah.edu/~golden](http://www.math.utah.edu/~golden).**Course Description:** Mathematics 2210 is an introduction to **multivariable calculus**. Vectors, functions, and motion in two and three dimensional space will be examined. Derivatives and integrals of functions of many variables will be developed. The fundamental differential operators of calculus in higher dimensions, **div**, **grad**, and **curl**, and their physical interpretations for fluid and electromagnetic fields, will be studied in detail. Integration of functions on curves, surfaces, and volumes will be developed. The course will conclude with an introduction to vector field theory and the theorems of Green, Gauss, and Stokes.**Course Outline:**

January	8-12	11.1 - 11.3	Vectors and the geometry of space	
	17-19	11.4 - 11.7	Motion and vector-valued functions	
	22-26	11.8 - 11.9	Surfaces; coordinate systems	
	29-2	12.1-12.4	Derivatives of multivariable functions	EXAM I (Feb. 2)
February	5-9	12.5-12.6	Directional derivatives and the gradient	
	12-16	12.7-12.9	Tangent planes; maxima and minima	
	21-23	13.1-13.3	Double integrals	
	26-2	13.4-13.6	Surface area; applications	EXAM II (March 2)
March	5-9	13.7-13.8	Triple integrals	
	12-16	13.9	Change of variables in multiple integrals	
	17-25		SPRING BREAK	
	26-30	14.1-14.2	Vector fields and line integrals	
April	2-6	14.3-14.4	Green's Theorem and path independence	EXAM III (April 6)
	9-13	14.5-14.6	Gauss's Theorem and surface integrals	
	16-20	14.7	Stokes's Theorem & Review	
	23		Partial differential equations of science	
	26-2			FINAL EXAMS

### Teaching Assistants (TA's):

Zexin Liu, zexin@math.utah.edu, 801-581-7653, LCB Loft.

Seungsu Lee, slee@math.utah.edu, 801-581-7653, LCB Loft.

### Discussion Hours:

There will be optional discussion sessions (or office hours) conducted by the TA's. During these sessions you can get help with webwork problems, exams, etc. Schedule of time and place will be posted.

### Getting Help:

- **Setting up a webwork account:** In class you'll be given information on how to get into your own Webwork account. If you encounter any problems, please contact the TA, and give your full name, course number and section, and student ID number.
- **Webwork feedback button:** When you use the feedback button within an exercise, state your question clearly. All relevant data about your question and answers is sent to the TA's. Please don't over-use this option, the TA's will be getting lots of emails.
- **Free tutoring:** Available all day M-F in the Rushing Undergraduate Math Center.

### Grades and Exams:

- (50%) Your two best scores on three in-class exams. The lowest of your three exam scores is dropped automatically in calculating the final grades. There are NO MAKE-UP EXAMS. You may bring one sheet of paper and a calculator to any exam, but NO laptops or wireless devices. Please bring University ID to all exams.
- (25% ) Final exam.
- (25% ) WeBWorK assignments.