

## List of Topics

The following is a list of topics that will be covered in this course along with the chapter and section numbers. The chapter and section numbers are taken from the textbook "Vector Calculus" (5th Edition), by J. Marsden and A. Tromba. There will also be several concepts presented that are not in the book.

### CHAPTER 5. DOUBLE AND TRIPLE INTEGRALS

- 5.2 The double integral over a rectangle
- 5.3 The double integral over more general regions
- 5.4 Changing the order of integration
- 5.5 The triple integral

### CHAPTER 6. THE CHANGE OF VARIABLES FORMULA AND APPLICATIONS OF INTEGRATION

- 6.1 The geometry of maps from  $\mathbf{R}^2$  to  $\mathbf{R}^2$
- 6.2 The change of variables theorem
- 6.3 Applications of double and triple integrals

### CHAPTER 7. INTEGRALS OVER PATHS AND SURFACES

- 7.1 The path integral
- 7.2 Line integral
- 7.3 Parametrized surfaces
- 7.4 Area of surface
- 7.5 Integrals of scalar functions over surface
- 7.6 Surface integrals of vector functions

### CHAPTER 8. THE INTEGRAL THEOREMS OF VECTOR ANALYSIS

- 8.1 Green's theorem
- 8.2 Stoke's theorem

### ADDITIONAL TOPICS

- 1. Fourier series
- 2. Laplace transforms