1 Chapter 4

1.1 Section 1

1. Be able to calculate the sum using sigma notation.

2. Be able to represent a sum in sigma notation.

3. Memorize and be able to use Gauss' formula: $\sum\limits_{i=1}^{n} i = \frac{n(n+1)}{2}$

1.2 Section 2

1. Know the definition of the Riemann Sum and the definite integral as a Riemann Sum, you may find the definition $\int\limits_{a}^{b} f(x)dx = \lim\limits_{n\to\infty} \sum\limits_{i=1}^{n} f(x_i)\Delta x_i$ more useful in practice than the one given in the text.

2. Understand the idea that the definite integral is the same as the area between the graph of a function and the x-axis.

3. Know and understand the implications of the integrability theorem.

4. Be able to calculate the definite integral of a first degree polynomial function using the Riemann sum definition of the definite integral.

5. Know the interval additive property as well as: $\int\limits_{a}^{b} f(x)dx = -\int\limits_{b}^{a} f(x)dx$

1.3 Section 3

1. Know the first fundamental theorem of calculus.

2. Know the implications of the linearity of the definite integral (Theorem D).

3. Know how to use u substitution to use the first fundamental theorem of calculus when the upper limit is complicated (Example 4).

4. Be able to calculate the position of an object as the accumulation of the velocity function (Example 5).

1.4   Section 4

1. Know the second fundamental theorem of calculus and how to use it to calculate definite integrals.

2. Be able to use u substitution to evaluate more complicated definite integrals.

1.5   Section 5

1. Know how to calculate the average value of a function.

2. Know how to use the mean value theorem for integrals to find the point c, where f(c) is equal to the average value of the function.

3. Understand the symmetry theorem and know how to use it to simplify a definite integral problem.

1.6   Section 6

1. Understand conceptually the different type of numerical integration schemes as well as in general which schemes perform better than others.

2   Homework Problems

Understand and be able to do all of the homework assignments (8-9)

There was not a homework assignment on sections 5-6, some additional problems that you may want to go over are:
Section 5: 1, 3, 11, 15, 17, 35, 37, 41
Section 6: Concepts Review Questions 3, 4

3   Practice Midterm

Understand and be able to solve all of the problems from the practice midterm.