Syllabus Summary

This is a living list and will be updated throughout the semester.

In this list I summarize the material from the syllabus indicating which material is

- very important,
- of normal importance,
- not required (so can be skipped), and
- not covered in class but you need to know. (I focus on covering the most common, important and non-obvious topics in class. Regretfully, there is not enough time to cover every example type in class. Every good math-diet always needs a good helping of these problem solving opportunities.)

See syllabus for complete list of topics.

1 Chapter 1

- **Formulas for area.** Besides area of a rectangle and circle you will normally be provided with formulas.
- Writing sums with sigma notation.
  - Arithmetic
  - Increases / decreases by an arithmetic sequence.
  - Geometric
  - Alternating signs
  - Gathering terms together in a useful way / telescoping
  - Manipulations (like index shift)
  - partial sums / convergence (will be covered in more detail in a later chapter)
- Applications (Many of these problems are long, so you wouldn’t find the whole of these problems on examinations, but perhaps parts and ideas from them)

2 Chapter 2

- Approximate definite integrals / area under the curve with a specified number of rectangles. (left end points, right end points, midpoint, trapezoid)
- Approximate definite integrals / area under the curve with \( n \) rectangles. (right end points (used for nearly all problems of this type), left end points, midpoint (very uncommon on exams)).
- Going from Riemann sums to definite integrals and backwards.
- Calculate definite integrals with geometry (i.e. when given regions of squares, rectangles, trapezoids and circles)
- Definite integral properties
3 Chapter 3

- Antiderivative of standard functions ($x^n$, sine, cosine, $e^x$)
- Fundamental theorems of calculus parts 1 and 2.
- When can’t you use fundamental theorems of calculus?
- Using symmetry to evaluate definite integrals.
- Area between curves.
- Reading a graph (many webwork problems on this type)