

Detailed Syllabus, Math 116

Textbook: Tom Apostol, Calculus, volume I, second edition.

Topics covered:

1. Foundations – theory and review (selections from Apostol):
 - a) real numbers, order completeness, complex numbers. From Apostol, Introduction (material before Chapter 1), sections 3.1-3.9, 3.11, lightly on 3.13-3.15; Chapter 9, sections 1-7.
 - b) limits and continuity. From Apostol, Chapter 3, sections 2-5, 7, 9, 10, 16.
 - c) differentiation. From Apostol, Chapter 4, sections 1-14.
 - d) integration. From Apostol, Chapter 1, sections 9-17, 20, 21; Chapter 3, sections 4 (Theorem 3.4), 18; Chapter 5, sections 1-3.
2. Vector algebra. Apostol, Chapter 12: full chapter.
3. Applications of vector algebra to analytic geometry. Apostol, Chapter 13: full chapter.
4. Calculus of vector-valued functions. Apostol, Chapter 14: full chapter (lightly on section 18).
6. Ordinary differential equations. Apostol, Chapter 8: full chapter.
7. Linear spaces – abstract vector spaces, inner product spaces. Apostol, Chapter 15: full chapter.
8. Linear transformations and matrices. Apostol, Chapter 16: sections 1-17.