Course Overview- Math 121-D. Benedetto

- **Transcendental and Inverse Functions, and L’Hôpital:**
  - Exponentials and Logarithms (Section 6.1-6.4) (Review)
  - Inverse Trigonometric Functions (Section 6.6)
  - Hyperbolic and Inverse Hyperbolic Functions (Section 6.7)
  - L’Hôpital’s Rule and Indeterminate Forms (Section 6.8)

- **Integration Methods:**
  - Integration by Parts (Section 7.1)
  - Trigonometric Integrals (Section 7.2)
  - Trigonometric Substitution, Completing the Square (Section 7.3)
  - Partial Fractions (Section 7.4)
  - Integration Strategies (Section 7.5)
  - Improper Integrals (Section 7.8)

- **Sequences and Series:**
  - Sequences (Section 11.1) and Introduction to Series (Section 11.2)
  - Integral Test and $p$-Test (Section 11.3)
  - Comparison and Limit Comparison Test (Section 11.4)
  - Alternating Series (Section 11.5)
  - Absolute and Conditional Convergence; Ratio and Root Tests (Section 11.6)
  - Series Testing Strategy (Section 11.7)
  - Introduction to Power Series (Section 11.8)
  - Representing Functions as Power Series (Section 11.9)
  - Taylor and MacLaurin Series (Section 11.10)

- **More Integration:**
  - Volumes of Revolution; Disks and Washer Methods (Section 5.2) (Review)
  - Volumes by Cylindrical Shells (Section 5.3)

- **Parametric Equations:**
  - Parametric Equations (Section 10.1) and their Calculus (Section 10.2)

- **Polar Coordinates:**
  - Introduction to Polar Coordinates (Section 10.3)
  - Area with Polar Coordinates (Section 10.4)
The best recommendation is to study one of these sections above each day for about a week. Make a plan and you will not be overwhelmed. Allow extra time for the following two concerns: the newest material is fresh in your mind, but you have not been tested on it. Allow time to solidify the fine details and to practice the last review packet (since the last exam 3). Secondly, allow time to review each technique of integration carefully. Some recent topics naturally included integration review. For polar curve area computation, we layered on top of trig. integrals. For volumes of revolution (shells method), we revisited Integration By Parts. However, topics like partial fractions, improper integrals or L'Hôpital’s Rule have been (largely) ignored for months now.

Plan of attack

Sunday April 30th: Chapter 6 (Exponentials/Logs, Inverse Trigonometric Functions, Hyperbolic Functions, L'H Rule)

Monday May 1st: Integration Methods (IBP, Trigonometric Integrals, Trigonometric Substitution) and Review Exam #1.

Tuesday May 2nd: Run at least one Practice Final Exam on Webpage.

Wednesday May 3rd: More Integration Methods (Complete Square, Partial Fractions, Improper Integrals).


Friday May 5th: Power Series, MacLaurin Series, and Volumes of Revolution. Run another Practice Final Exam on Webpage.

Saturday May 6th: Parametric Equations and Review Exam #3.

Sunday May 7th: Polar Coordinates and Quiz #12 and Final Review Packet

Monday May 8th: Run 2 More Practice Final Exams on Webpage and Finish Reviewing all materials.

Tuesday May 9th: FINAL EXAM SMUDD 204, 9:00–12:00 noon

Webpage: www3.amherst.edu/~dbenedetto/math121