Introduction to Analysis I

Mathematics 242

Section: D100

Term: 2013 Fall

Instructor: Tom Archibald

Discussion Topics: Calendar Description:
Mathematical induction.
Limits of real sequences and real functions. Continuity and its
consequences. The mean value theorem. The fundamental theorem of
calculus. Series.

Course Outline:
Logic and Proof:
     * connectives
     * quantifiers
     * techniques of proof

Sets and Functions:
     * basic set operations
     * relations
     * functions
     * cardinality

  The Real Numbers:
     * natural numbers and induction
     * ordered fields
     * the completeness axiom

  Sequences:
     * convergence
     * limit theorems
     * monotone sequences
     * Cauchy sequences
     * subsequences

 Limits and Continuity:
     * limits of functions
     * continuous functions
     * properties of continuous functions
     * uniform continuity

  Differentiation:
     * derivative
     * mean value theorem

  Integration:
     * Riemann integral
     * properties of the Riemann integral
     * fundamental theorem of calculus

 Infinite series:
     * convergence
     * convergence tests
     * power series
     * uniform convergence

Grading: Assignments- 25%
Midterms - 25%
Final Exam - 50%

Introduction to Analysis I

Required Texts: Analysis with an Introduction to Proof
5/ E
Steven R Lay
Pearson
9780131481015

Recommended Texts:

Materials/Supplies:

Prerequisite/Corequisite:
Prerequisite: MATH 152; or MATH 155 or 158 with a grade of B. Quantitative.

Notes: THE INSTRUCTOR RESERVES THE RIGHT TO CHANGE ANY OF THE ABOVE INFORMATION.
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return of course papers and the posting of marks. Please pay careful attention to the options
discussed in class at the beginning of the semester.

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