

Math 300 – Perspectives in Analysis

Course Description from Bulletin: The course is focused on selected topics related to fundamental concepts and methods of classic analysis and their applications with emphasis on various problem-solving strategies, visualization, mathematical modeling, and interrelation of different areas of mathematics. (3-0-3)

Enrollment: Elective for Mathematics Education, Applied Mathematics, and other majors. To be cross-listed with MSED 521.

Textbook(s): No formal textbook is available at this time. Problems are drawn from various problem books including:

M. Yaglom, D. O. Shklarsky, N. N. Chentzov (1993), *The USSR Olympiad Problem Book: Selected Problems and Theorems of Elementary Mathematics*, Dover Publications (ISBN 0-486-27709-7)

Roger B. Nelsen (1997), *Proofs without Words: Exercises in Visual Thinking*, Mathematical Association of America (ISBN 0-883-85700-6)

Roger B. Nelsen (2001),

3. Algebraic structure of rational numbers. Equivalence relations. Real numbers as sequences of rationals	5
4. Proof by contradiction. “Epsilon-Delta” proof. Limits	5
5. Visualization in analysis. Proof without words	5
6. Counterexamples in analysis	4
7. Power series, binomial coefficients, and related problems	4
8. Investigation and graphing functions	4
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