Syllabus — Math 122, Mathematics for Elementary Teachers II
Harold Washington College — One of the City Colleges of Chicago

Semester: Spring 2004
Instructor: Dr. A. N. DiVito, Professor of Mathematics
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Grading:
• Final grades will be determined by averaging the scores of the four full period examinations.
• Assignments will be collected at the end of each class. Attendance and homework are mandatory and will be used to decide final grades in borderline cases. Poor attendance may result in a lower grade, at the discretion of the instructor, without regard to other performance.
• The usual, but not guaranteed, conversions from percent score to letter grade are as follows: 86–100: A; 80–85: A/B; 70–79: B; 60–69: C; 50–59: D; 00–49: F.

Topics and Assignments:

Chapter 5 — The Basics of Algebra

5.1 Real Number Arithmetic (for Numbers as Positions)
Addition as movement along the number line; the identity and inverses for addition; definition of subtraction; multiplication as stretching/shrinking/reversing; the identity and inverses for multiplication; definition of division; division by 0 is undefined; \(-1 \cdot u = -u\); three meanings of the symbol –
Assignment: sectional problems

5.2 The Cornerstones of Algebra
The Order of Operations; commutative, associative, and distributive laws; generalized commutative, associative and distributive laws; terminology: we add terms to obtain a sum, we multiply factors to obtain a products
Assignment: sectional problems
5.3  *A Primer on Sets*
Explicit vs. implicit set notations; terminologies and notations; interval notation; 
Venn diagrams
**Assignment:** sectional problems

5.4  *Linear Equations in One Variable*
Terminologies and techniques involving linear equations in one variable; 
strategies for approaching word problems; phenomenological experiments: model 
cars, mixing solutions, rates of fill
**Assignment:** sectional problems

5.5  *Elementary Proofs*
(e.g., to include divisibility tests, the Euclidean Algorithm, the infinity of primes)
**Assignment:** TBA

Chapter 6 — Notions from Geometry

6.1  *The Triangle — A Rigid Polygon*
(includes translations, rotations, and reflections)
**Assignment:** TBA

6.2  *Similarity*
**Assignment:** TBA

6.3  *Polygons, Perimeter and Area*
**Assignment:** TBA

6.4  *Circles, Circumference and Area*
**Assignment:** TBA

6.5  *Solid Geometry: Surface Area and Volume*
**Assignment:** TBA

Chapter 7 — The Fundamentals of Pre-Calculus

7.1  *Ordered Pairs and Points in the Plane*
**Assignment:** TBA
7.2 Relations and the Elementary Curves
Assignment: TBA

7.3 Straight Lines and Their Intersections
Assignment: TBA

7.4 The Study and Importance of Functions
Assignment: TBA

Chapter 8 — Basic Concepts from Statistics

to include:
- mean, median, and mode
- standard deviation (sample and population)
- z-scores, bar graphs, line graphs, pie charts, box and whisker plots
Assignment: TBA

Chapter 9 — Elementary Probability Theory

to include:
- permutations and combinations
- odds, events, experiments, outcomes, sample spaces
- \(0 \leq P(E) \leq 1\), \(P(E) = 1 - P(E')\), \(P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)\)
Assignment: TBA

Chapter 10 — Introduction to Infinity and the Advanced Realm

To possibly include:
- compound interest, the definition of \(e\), continuous interest
- finite geometric series
- the ordinary annuity and amortization tables
- Heraclitus, Parmenides, and the Paradoxes of Zeno
- why \(0.999\ldots\) is not less than 1
- why \(\{1, 2, 3, \ldots\}\) and \(\{2, 4, 6, \ldots\}\) are the same size
Assignment: TBA