

# Textbook Information

## Math 118 PRY – Fall 2012 – General Education Mathematics

The class's textbook policy is as follows. **Students must have a general education book but it does NOT have to be the official textbook designated for this course.** This policy is intended to lower textbook costs. Usually students can purchase a textbook for the course under \$40.

The textbook for this course is the *The Nature of Mathematics* by Karl J. Smith, 12th edition, Brooks/Cole, 2012; ISBN Number: 978-0-538-73758-6. Students are welcome to use the any previous edition at a much lower cost.

Students also may use other general education text books. These include:

- **Any previous edition of our textbook** – this option is highly recommended, this textbook is very good
- *A Survey of Mathematics with Applications*; Allen R. Angel, Christine D. Abott, and Dennis C. Runde; Pearson Education Inc., (any edition)
- *Mathematics, one of the Liberal Arts*; Thomas J. Miles and Douglas W. Nance; Brooks/Cole, (any edition)
- *Mathematical Excursion*; Richard N. Aufmann, Joanne S. Lockwood, Richard D. Nation, Daniel K. Clegg; Houghton Mifflin, (any edition)
- *Thinking Mathematically*; Robert Bitzer, Prentice Hall, (any edition)
- *Mathematics in Our World*, Alan G. Bluman; McGraw Hill, (any edition)

# Contents of Textbook

## Chapter 1 – The Nature of Problem Solving

- 1.1 Problem Solving
- 1.2 Inductive and Deductive Reasoning
- 1.3 Scientific Notation and Estimation

## Chapter 2 – The Nature of Sets

- 2.1 Sets, Subsets, and Venn Diagrams
- 2.2 Operation with Sets
- 2.3 Application of Sets
- 2.4 Finite and Infinite Sets

## Chapter 3 – The Nature of Logic

- 3.1 Deductive Reasoning
- 3.2 Truth Tables and the Conditional
- 3.3 Operations and Laws of Logic
- 3.4 The Nature of Proof
- 3.5 Problem Solving Using Logic
- 3.6 Logic Circuits

## Chapter 4 – The Nature of Numeration Systems

- 4.1 Early Numeration Systems
- 4.2 Hindu-Arabic Numeration System
- 4.3 Different Numeration Systems
- 4.4 Binary Numeration System
- 4.5 History of Calculating Devices

## Chapter 5 – The Nature of Numbers

- 5.1 Natural Numbers
- 5.2 Prime Numbers
- 5.3 Integers
- 5.4 Rational Numbers
- 5.5 Irrational Numbers
- 5.6 Groups, Fields, and Real Numbers
- 5.7 Discrete Mathematics
- 5.8 Cryptography

## Chapter 6 – The Nature of Algebra

- 6.1 Polynomials
- 6.2 Factoring
- 6.3 Evaluation, Applications, and Spreadsheets
- 6.4 Equations
- 6.5 Inequalities
- 6.6 Algebra in Problem Solving
- 6.7 Ratios, Proportions, and Problem Solving
- 6.8 Percents
- 6.9 Modeling Uncategorized Problems

## Chapter 7 – The Nature of Geometry

- 7.1 Geometry
- 7.2 Polygons and Angles
- 7.3 Triangles
- 7.4 Similar Triangles
- 7.5 Right Triangle Trigonometry
- 7.6 Mathematics Art, and Non-Euclidean Geometries

## Chapter 8 – The Nature of Networks and Graph Theory

- 8.1 Euler Circuits and Hamiltonian Cycles
- 8.2 Trees and Minimum Spanning Trees
- 8.3 Topology and Fractals

## Chapter 9 – The Nature of Measurement

- 9.1 Perimeter
- 9.2 Area
- 9.3 Surface Area, Volume, and Capacity
- 9.4 Miscellaneous Measurements

## Chapter 10 – The Nature of Growth

- 10.1 Exponential Equations
- 10.2 Logarithmic Equations
- 10.3 Applications of Growth and Decay

## Chapter 11 – The Nature of Financial Management

- 11.1 Interest
- 11.2 Installment Buying
- 11.3 Sequences
- 11.4 Series
- 11.5 Annuities
- 11.6 Amortization
- 11.7 Summary of Financial Formulas

## Chapter 12 – The Nature of Counting

- 12.1 Permutations
- 12.2 Combinations
- 12.3 Counting without Counting
- 12.4 Rubik's Cube and Instant Insanity

## Chapter 13 – The Nature of Probability

- 13.1 Introduction to Probability
- 13.2 Mathematical Expectation
- 13.3 Probability Models
- 13.4 Calculated Probabilities
- 13.5 The Binomial Distribution

## Chapter 14 – The Nature of Statistics

- 14.1 Frequency Distributions and Graphs
- 14.2 Descriptive Statistics
- 14.3 The Normal Curve
- 14.4 Correlation and Regression
- 14.5 Sampling

## Chapter 15 – The Nature of graphs and Functions

- 15.1 Cartesian Coordinates and Graphing Lines
- 15.2 graphing Half-Planes
- 15.3 Graphing Curves
- 15.4 Conic Sections
- 15.5 Functions

**Chapter 16 – The Nature of Mathematical Systems**

- 16.1 Systems of Linear Equations
- 16.2 Problem Solving with Systems
- 16.3 Matrix Solution of a System of Equations
- 16.4 Inverse Matrices
- 16.5 Modeling with Linear Programming

**Chapter 17 – The Nature of Voting and Apportionment**

- 17.1 Voting
- 17.2 Voting Dilemmas
- 17.3 Apportionment
- 17.4 Apportionment Paradoxes

**Chapter 18 – The Nature of Calculus**

- 18.1 What is Calculus?
- 18.2 Limits
- 18.3 Derivatives
- 18.4 Integrals