Using and Understanding Mathematics: A Quantitative Reasoning Approach

From Book News, Inc. "Aimed at students majoring in nonmathematical fields--particularly those who feel
some anxiety about math--this textbook focuses on the practical applications of mathematics in college,
career, and life. Although not remedial in nature, the text is suitable for students with a wide range of
mathematical backgrounds. The use of critical thinking skills is emphasized throughout. Topics include, for
example, income taxes, statistical reasoning, mathematics and music, voting theory, and exponential
population growth. Table of Contents (by Chapter)

1. Principles of Reasoning. 1A The Forces of Persuasion, An Overview of Common
Fallacies, 1B Propositions: The Building Blocks of Arguments, 1C Arguments: Deductive
and Inductive, 1D Analyzing Real Arguments.

2. Statistical Reasoning. 2A Fundamentals of Statistics, 2B Should you believe a
Statistical Study?, 2C Basic Statistical Graphs, 2D Graphs in the Media, 2E Causal
Connections.

3. Problems Solving Tools. 3A Using Unit Analysis, 3B Systems of Standardized Units,
3C The Process of Problem Solving.

4. Numbers in the Real World. 4A Concepts of Numbers, 4B Uses and Abuses of
Percentages, 4C Putting Numbers in Perspective, 4D Dealing With Uncertainty.

5. Financial Management. 5A The Power of Compound Interest, 5B Savings Plans
(Annuities), 5C Loan Payments, Credit Cards and Mortgages, 5D Income Taxes, 5E
Investments.

6. Modeling our World. 6A Functions: The Building Blocks of our Mathematical Models,
6B Linear Graphs and Modeling, 6C Formulas as Models.

7. Exponential Growth and Decay. 7A Exponential Astonishment, 7B Doubling Time and
Half Life, 7C Exponential Modeling, 7D Real Population Growth.

8. Probability: Living with the Odds. 8A Principles of Counting, 8B Fundamentals of
Probability, 8C Combining Probabilities, 8D The Law of Averages, 8E Probability, Risk
and Coincidence.

9. Putting Statistics to Work. 9A Characterizing Data, 9B Linear Regression Models, 9C
Statistical Inference, 9D Sample Issues in Statistical Research.

10. Mathematics and the Arts. 10A Fundamentals of Geometry, 10B Mathematics and
Music, 10C Perspective and Symmetry, 10D Proportion and the Golden Ratio, 10E
Fractal Geometry.

11. Discrete Mathematics in Business and Society. 11A Network Analysis, 11B The
Traveling Salesman Problem, 11C Project Design, 11D Voting. Does the Majority

12. The Power of Numbers. A few more topics. 12A Balancing the Federal Budget, 12B
Energy: Our Future depends on it, 12C Density and Concentration, 12D Logarithmic
Scales: Earthquakes, Sounds and Acids.
For All Practical Purposes: Mathematical Literacy in Today's World by COMAP (1988, 6th ed. 2002) "COMAP -- the Consortium of Mathematics and Its Applications -- is a group of mathematicians and educators dedicated to the improvement in the teaching of math by demonstrating to students how math is a crucial part of the world around us. They believe that students must cultivate an understanding of math -- develop mathematical literacy -- if they are to succeed in a society that is increasingly process-driven and where problem-solving skills are increasingly important."

- Part I: Management Science. Ch 1: Street Networks, Ch 2: Visiting Vertices, Ch 3 Planning & Scheduling, Ch 4: Linear Programming.
- Part 5: On Size and Shape. Ch 16: Growth and Form, Ch 17: Symmetry and Patterns. Ch 18: Tilings.

Quantitative Reasoning: Understanding the Mathematical Patterns of Nature by Frederick P. Greenleaf (2nd ed, 2000) "To Students: "This is not a math course in the familiar sense." The purpose of this course is "to show why mathematics is necessarily the language of science." The math topics we cover are fairly elementary, but our use of them is not. In order to understand how scientists think, you have to learn to think for yourself using the tools that mathematics provides. This course aims to show how one can take real world problems, translate them into mathematics, and solve them." "Quantitative Reasoning explores the mathematical tools you will need to understand why mathematics became the language of science." To Instructors: These materials "address the issue of promoting quantitative literacy among the vast majority of college students who do not intend to major in mathematics of the sciences. They were also designed to be a vehicle for enhancing math and science backgrounds of the non-specialist K-12 teachers in training."

3. How Big is the Sun, How Far are the Stars? Scaling Transformations, Size & Form, Angles & Size of the Earth, Measuring the Inaccessible: Triangulation, Angular Diameter and the Resolving Power of the Eye, Next Steps in the Cosmic Distance Ladder, Method of Std. Candles.

Quantitative and Qualitative Reasoning Skills by James F. Burkhart (2nd ed, 1999)


1. Literacy. 1.1 Economic Value, 1.2 Social Value, 1.3 Necessary Skills, 1.4 Course Mechanics, 1.5 Group Dynamics.
3. Learning and Working in Groups. 3.1 What is Learning?, 3.2 Components of Knowledge, 3.3 Levels of Learning, 3.4 How We Learn, 3.5 Natural Abilities, 3.6 Thinking Skills, 3.7 Learning in Teams, 3.8 Roles within Teams, 3.9 Team Strategies.
5. Algebra and Spreadsheets. 5.1 Egyptian Algebra, 5.2 Babylonian Algebra, 5.3 Greek Algebra, 5.4 Indian Algebra, 5.5 Language of Algebra, 5.6 Number Systems, 5.7 Spreadsheets, 5.8 Connecting Algebra to Spreadsheets, 5.9 Graphing Functions using Spreadsheets.
7. Apportionment. 7.1 History, 7.2 Basic Terminology, 7.3 Methods of Apportionment.
8. Functions and Modeling. 8.1 Basic Units of Measurement, 8.2 Modeling the Heavens, 8.3 Linear Models, 8.4 Exponential Models, 8.5 Relations and Functions, 8.6 Curve Fitting.
10. Internet Essentials. 10.1 History, 10.2 Electronic Mail, 10.3 Finding Information on the Web, 10.4 Surfing Cyberspace, 10.5 Internet Glossary.

Mathematics for your world: The application of quantitative reasoning to day-to-day problems by Growney (1982)
Understanding our Quantitative World
by Janet Anderson and Todd Swanson (1st ed. 2004). Preface and Detailed Table of Contents
The perfect text for a general education mathematics course.

This text is intended for a general education mathematics course. The authors focus on the topics that they believe students will likely encounter after college. These topics fall into the two main themes of functions and statistics. After the concept of a function is introduced and various representations are explored, specific types of functions (linear, exponential, logarithmic, periodic, power, and multivariable) are investigated. These functions are explored symbolically, graphically, and numerically and are used to describe real world phenomena. On the theme of statistics, the authors focus on different types of statistical graphs and simple descriptive statistics. Linear regression, as well as exponential and power regression, is also introduced. Simple types of probability problems as well as the idea of sampling and confidence intervals are the last topics covered in the text.

The text is written in a conversational tone. Each section begins by setting the mathematics within a context and ends with an application. The questions at the end of each section are called Reading Questions because students are expected to be able to answer most of these after carefully reading the text. Activities and Class Exercises are also found at the end of each section. These activities are taken from public sources such as newspapers, magazines, and the World Wide Web. Doing these activities demonstrates to students that they can use mathematics as a tool in interpreting quantitative information they encounter outside of the academy. The course is designed to allow students to spend most of their time in class working in groups on the activities. Rather than having students passively listen, this approach requires students to read, discuss, and apply mathematics. The text assumes that students will have access to some type of technology such as a graphing calculator.


Excursions in Modern Mathematics by Peter Tannenbaum (5th ed., 2003)
Book Description: "This collection of "excursions" into modern mathematics is written in an informal, very readable style, with features that make the material interesting, clear, and easy-to-learn. It centers on an assortment of real-world examples and applications, demonstrating attractive, useful, and modern coverage of liberal arts mathematics. The book consists of four independent parts, each consisting of four chapters—1) Social Choice, 2) Management Science, 3) Growth and Symmetry, and 4) Statistics. For the study of mathematics."
Preface of 1998 edition, "We have made an concerted effort to introduce the reader to a view of mathematics that is entirely different from the traditional algebra-geometry-trigonometry-finite math curriculum that so many people have learned to dread, fear and occasionally abhor. The notion that general education mathematics must be dull, unrelated to the real world, highly technical and deal mostly with concepts that are historically ancient is totally unfounded. Applicability: The connection between the mathematics presented here and down-to-earth, concrete real-life problems is direct and immediate." Accessibility: We have found Intermediate Algebra to be an appropriate and sufficient prerequisite. Aesthetics: A fundamental objective of this book is to develop an appreciation for the aesthetic elements of mathematics."

Book News: "Emphasizing problem-solving skills, this introductory textbook contains 14 chapters covering: critical thinking; logic; sets, relations, and functions; whole numbers and numeration; integers and number theory; rational numbers; real numbers; consumer mathematics; probability; statistics; informal geometry; measurement and the metric system; transformations; and algebra, geometry, and graph theory."


MATHEMATICS FOR THE LIBERAL ARTS


Mathematics for the Liberal Arts II by Miller, Heeren, et al. (1999)


Math for Liberal Arts by Richman (1998)

Mathematics: One of the Liberal Arts by Thomas J. Miles, Douglas W. Nance (1st ed., 1997) Book Description: "This text includes a history of math and covers logic, computing, finance, and geometry. The numerous exercise and problem sets, including writing exercises, provide non-majors with a thorough foundation of mathematics."

Liberal arts mathematics by Joseph Newmark (1992*)


Instructors Guide to Math Liberal Arts by Johnny Lott, Richard Billstein (1986*)

FUNDAMENTAL CONCEPTS OF MATHEMATICS


* Special Order or Out Of Print/Limited Availability.
TEXTBOOK Recommended - Using & Understanding Mathematics: A Quantitative Reasoning Approach (7th Edition) by Bennett and Briggs. NOTE: Students may use a TI-30XS or TI-30X IIS scientific calculator on exams in this course. No other calculators are permitted. Sections Covered. Chapter 2-Approaches to Problem Solving. 2A Understand, Solve, and Explain. Learn a general problem-solving process, along with the basic principles of unit analysis that can be very useful to this approach. 2B Extending Unit Analysis. Review standardized units, and apply unit analysis to problems involving energy. The quantitative reasoning part of the theory gained some popularity, but its most important features (at least in my thinking), the...Â We use cookies to offer you a better experience, personalize content, tailor advertising, provide social media features, and better understand the use of our services. To learn more or modify/prevent the use of cookies, see our Cookie Policy and Privacy Policy. Accept Cookies.Â I also discuss how a focus in school mathematics on quantitative reasoning and its extension into algebra could be leveraged with regard to studentsâ€™ engagement in authentic mathematical modeling. Its quantitative reasoning approach helps students to build the skills needed to understand major issues in everyday life, and compels students to acquire the problem-solving tools that they will need to think critically about quantitative issues in contemporary society. This program will provide a better teaching and learning experienceâ€”for you and your students.Â NEW MyLab Math with Pearson eText -- Instant Access -- for Using and Understanding Mathematics: A Quantitative Reasoning Approach, 6th Edition. NEW MyLab Math with Pearson eText -- Instant Access -- for Using and Understanding Mathematics: A Quantitative Reasoning Approach, 6th Edition Bennett & Briggs ©2015. Format. Website.