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)


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


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 or 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.
Using and Understanding Mathematics: A Quantitative Reasoning Approach prepares students for the mathematics they will encounter in college courses, their future career, and life in general. 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. 60 views.