Using Open Educational Resources in Math Courses

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# OER Textbooks

1. **OpenStax** ([https://openstax.org/](https://openstax.org/))

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And backed by additional learning resources. Review our OpenStax textbooks and decide if they are right for your course. Simple to adopt, free to use. We make it easy to improve student access to higher education.

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## About Our Textbooks

### Expert Authors

Our open source textbooks are written by professional content developers who are experts in their fields.

### Standard Scope and Sequence

All textbooks meet standard scope and sequence requirements, making them seamlessly adaptable into existing courses.

### Standard Scope and Sequence

OpenStax textbooks undergo a rigorous peer review process. You can view the list of contributors when you click on each book.

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2. American Institute of Mathematics (AIM) (http://aimath.org/textbooks/)

Approved Textbooks

The list below groups open textbooks by course title. All the books have been judged to meet the evaluation criteria set by the AIM editorial board.

- **Liberal Arts Math**
  - *Math in Society*
    - David Lippman
  - *Mathematical Discovery*
    - Andrew M. Bruckner, Brian S. Thomson, Judith B. Bruckner

- **Elementary and Intermediate Algebra**
  - ORCCA: Open Resources for Community College Algebra
    - Portland Community College
  - *Elementary Algebra*
    - Katherine Yoshiwara
  - *Intermediate Algebra: Functions and Graphs*
    - Katherine Yoshiwara
  - *OpenStax Intermediate Algebra*
    - Lynn Maracek, Senior Contributing Author

- **College Algebra and Precalculus**
  - *Modeling, Functions, and Graphs: Algebra for College Students*
    - Katherine Yoshiwara
  - *Applied Combinatorics*
    - Mitchel T. Keller and William T. Trotter

- **Introduction to Proofs**
  - *Book of Proof*
    - Richard Hammack
  - *A Gentle Introduction to the Art of Mathematics*
    - Joseph E. Fields
  - *Mathematical Reasoning: Writing and Proof*
    - Ted Sundstrom

- **Discrete Math**
  - *Applied Discrete Structures*
    - Alan Doerr and Kenneth Levasseur
  - *Discrete Mathematics: An Open Introduction*
    - Oscar Levin
  - *Discrete Mathematics: First and Second Course*
    - Edward A. Bender and S. Gill Williamson

- **Combinatorics**
  - *Applied Combinatorics*
    - Mitchel T. Keller and William T. Trotter

- **Real Analysis**
  - *Basic Analysis: Introduction to Real Analysis*
    - Jiří Lebl
  - *Introduction to Real Analysis*
    - William F. Trench
  - *Elementary Real Analysis*
    - Brian S. Thomson, Judith B. Bruckner, Andrew M. Bruckner
  - *Mathematical Analysis I*
    - Elias Zakon
  - *How We Got from There to Here: A Story of Real Analysis*
    - Robert Rogers and Eugene Boman

- **Complex Analysis**
  - *A First Course in Complex Analysis*
    - Matthias Beck, Gerald Marchesi, Dennis Pixton, Lucas Sabalka

- **Geometry and Topology**
  - *Geometry with an Introduction to Cosmic Topology*
    - Michael P. Hitchman
Precalculus
David H. Collingwood, K. David Prince, Matthew M. Conroy

Precalculus / College Algebra / Trigonometry
Carl Stitz and Jeff Zeager

Trigonometry
Katherine Yoshiwara

College Trigonometry
Carl Stitz and Jeff Zeager

Calculus
David Guichard

Active Calculus
Matt Boelkins

APEX Calculus
Gregory Hartman, Brian Heinold, Troy Siemers, Dimplekumar Chalishajar

CLP Calculus
Joel Feldman, Andrew Rechnitzer, Elyse Yeager

Calculus in Context
James Callahan, lead author

Calculus I, II, III
Jerrold E. Marsden and Alan Weinstein

Calculus
Gilbert Strang

OpenStax Calculus
Gilbert Strang and Edwin Herman, lead authors

Combinatorics Through Guided Discovery
Kenneth Bogart

Foundations of Combinatorics with Applications
Edward A. Bender and S. Gill Williamson

Computing and Numerical Analysis

Sage for Undergraduates
Gregory Bard

Computational Mathematics with SageMath
Paul Zimmermann et al.

Tea Time Numerical Analysis
Leon Q. Brin

Number Theory

Number Theory: In Context and Interactive
Karl-Dieter Crisman

Elementary Number Theory: Primes, Congruences, and Secrets
William Stein

A Computational Introduction to Number Theory and Algebra
Victor Shoup

Abstract Algebra

Abstract Algebra: Theory and Applications
Tom Judson

Probability

Introduction to Probability
Charles M. Grinstead and J. Laurie Snell

Probability: Lectures and Labs
Mark Huber

Statistics

OpenIntro Statistics
David M. Diez, Christopher D. Barr, Mine Çetinkaya-Rundel

Introductory Statistics for the Life and Biomedical Sciences
Julie Vu and David Harrington

SticiGui
Philip Stark

Online Statistics Education
David Lane, lead author

Logic

A Friendly Introduction to Mathematical Logic
Christopher C. Leary and Lars Kristiansen
Books Using Sage

Several of the textbooks on the approved list make extensive use of Sage.

- **A First Course in Linear Algebra**
  Rob Beezer

- **Abstract Algebra: Theory and Applications**
  Tom Judson

- **Applied Discrete Structures**
  Alan Doerr and Kenneth Levasseur

- **Number Theory: In Context and Interactive**
  Karl-Dieter Crisman

- **Sage for Undergraduates**
  Gregory Bard

- **Elementary Number Theory: Primes, Congruences, and Secrets**
  William Stein

- **Computational Mathematics with SageMath**
  Paul Zimmermann et al.
3. OpenIntro (https://www.openintro.org/)

OpenIntro Statistics
OpenIntro Statistics is a dynamic take on the traditional curriculum, being successfully used at Community Colleges to the Ivy League.

Advanced High School Statistics
AHSS meets the needs of a high school statistics course and is especially suitable for an AP® Statistics course.

College Algebra + Trigonometry (Precalculus)
As part of a pilot program, OpenIntro is providing desk copies for this textbook by Carl Stitz and Jeff Zeager.

Intro Statistics with Randomization and Simulation
Bringing a fresh approach to intro statistics, ISRS introduces inference faster using randomization and simulation techniques.

Intro Statistics for the Life and Biomedical Sciences
Also known as "OpenIntro Biostatistics", this book is suited for both undergraduate and graduate courses.

APEX Calculus
As part of a pilot program, OpenIntro is providing desk copies for this textbook by Dr. Gregory Hartman, et al.
OER Software

MyOpenMath  (https://www.myopenmath.com/ )

Free and Open

Students

Are you a student looking to study mathematics on your own, and want to do exercises with immediate feedback as you work through a free and open textbook? Then read more about our self study courses.

Instructors

Are you an instructor who wants to adopt an open textbook, who feels online interactive homework is valuable, but doesn't want their students to have to pay an additional fee? Then read more about using MyOpenMath in the classroom.

Getting Started

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Using OER in Math Courses

Departmental OER Adoption
1. Algebra Essentials – MAT 099
2. Precalculus Mathematics Plus – MAT 155P

OER Adoption in my Classes
1. Math for Liberal Arts Plus – MAT 135P
2. Calculus I with Technology – MAT 243
3. Calculus II with Technology – MAT 244
4. Applied Linear Algebra – MAT 310
5. Differential Equations – MAT 341

Wrap-up
1. OER Textbooks
   • OpenStax (https://openstax.org/)
   • American Institute of Mathematics (AIM) (http://aimath.org/textbooks/)
   • OpenIntro (https://www.openintro.org/)

2. OER Software
   • MyOpenMath (https://www.myopenmath.com/)

3. Using OER in Math Courses