



Texas Education Agency and Austin Community College

Biotechnology Online Continuing Education Project

Biotechnology Textbook Resources

There are many excellent textbooks in laboratory techniques, biotechnology, molecular biology, genetics, and general biology that do a good job of supporting biotechnology education. The following list include some of our favorites in the Austin Community College Biotechnology Department. Many in this list are not heavily marketed, but are uniquely useful in teaching concepts and methods important to the biotechnology field. We hope that you find these resources useful!

Another more extensively list of textbooks for biotechnology curricula can be found at the NSF-supported Bio-Link webpage, in its "Curriculum Clearinghouse": www.bio-link.org.

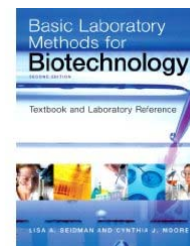
Basic Laboratory Methods for Biotechnology (2nd Edition) by Lisa A. Seidman & Cynthia J. Moore

ISBN-13: 978-0-321-57014-7

Publisher: Pearson Benjamin-Cummings Publishing Company

Spiral bound, 751pp

Pub. Date: January 2009



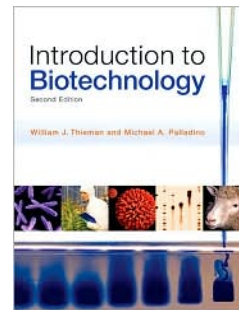
This is the "bible" of lab management and anyone responsible for setting up, maintaining, and managing a laboratory should have one for a reference. We use this manual for most of our biotechnology courses at Austin Community College. A systematic and practical introduction to the bioscience laboratory is provided in nine units that discuss an introduction to the workplace, product quality control, math, data analysis, safety, measurements, solutions, separation methods, and computers in the biotechnology lab.

Some topics covered include:

- Math in the laboratory
- Preparing solutions
- Measurements
- Safety
- Separations
- Using computers in the lab
- Quality control
- Data analysis

Introduction to Biotechnology (2nd Edition), by William J Thieman & Michael A. Palladino

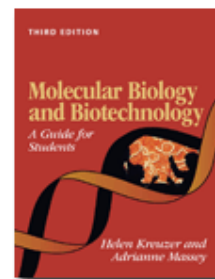
ISBN-13: 9780321491459
Publisher: Benjamin Cummings
Paperback, 408pp
Pub. Date: August 2008



Highly recommended by high school teachers, this popular textbook provides the tools, practice, and basic knowledge for success in the biotech workforce and is thoroughly updated with practical information on the latest developments in the biotechnology field. Introduction to Biotechnology is the first biotechnology textbook geared specifically for the diverse scientific backgrounds of undergraduate students interested in pursuing a career in biotechnology. With its balanced coverage of basic molecular biology, historical developments, and contemporary applications, the text provides the tools and basic knowledge for success in the biotech industry for college instructors, students, or anyone interested in biotechnology.

Molecular Biology and Biotechnology: A Guide for Students, (3rd Edition) by Helen Kreuzer & Adrienne Massey

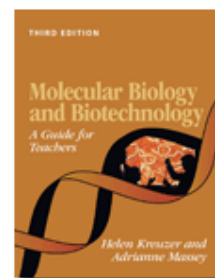
Book ISBN or Item Number: 978-1-55581-472-4
Publisher: ASM Press
Paperback, 498 pages, two-color throughout with full-color insert, illustrations, glossary, index.
Publication Date: Oct 2007



Presented from the perspective of the biotech industry, this laboratory handbook/textbook reference gives a systematic, understandable, and practical introduction to fundamental laboratory methods and provides a foundation upon which students can build a career in the lab. The authors balance background and theory with practical information, drawing material from many sources: analytical chemistry texts, molecular biology manuals, industry standards, government regulations, manufacturer and supplier information. Serving as both a textbook and a laboratory manual, activities are presented that have been field tested, most for more than a decade

Molecular Biology and Biotechnology: A Guide for Teachers, (3rd Edition) by Helen Kreuzer & Adrienne Massey

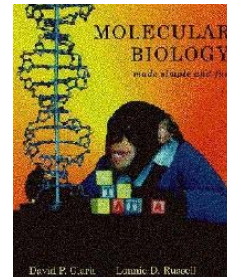
Book ISBN or Item Number: 978-1-55581-471-7
Publisher: ASM Press
Paperback, 718 pages
Publication Date: Oct 2007



The teacher volume includes all of the information contained within the student volume, and it also incorporates numerous pedagogical resources. For instance, the instructor's volume includes a comprehensive CD-ROM containing chapter figures, templates and worksheets, laboratory resources, and teaching resources. Additionally, the authors explain the nuts and bolts of running a molecular biology laboratory, such as aseptic technique, using micropipettes, keeping microbial cultures well fed and happy, and crucial safety steps. These books are written in a clear, easy-to-understand language that makes complicated information accessible to those with minimal background in this area. They serve as both a textbook and a laboratory activities manual and are designed for those instructors interested in "problem-based" approaches for teaching and learning. A companion instructor CD-ROM is available with many valuable teaching implements including worksheets, templates, and teaching tips.

Molecular Biology: Made Simple and Fun, (3rd Edition) by David P. Clark & Lonnie Dee Russell

ISBN-13: 9781889899077
Publisher: ASM Press
Paperback, 515 pages
Publication Date: April 2005



The authors present a simple and fun approach to the topic of molecular biology. Written primarily for the science student, but suitable for the non-scientist, the reader will gain a solid understanding of the fundamentals and tools of molecular biology. The book also details how this rapidly advancing field has and will continue to have an impact on health, law, agriculture, biotechnology and our understanding of the origins of the species.

Biotechnology: Science for the New Millennium, by Ellen Daugherty

ISBN-13: 978-0008195397
Publisher: EMC/Paradigm
Spiral bound
Pub. Date: 2007



Another book popular with high school teachers, this manual teaches the tools and techniques of working independently or as a team member in a biotechnology facility, focusing on the process, methods, and applications of biotechnology. It emphasizes on-the-job thinking and problem solving through scenario activities that require students to summarize the results of experiments and trouble-shoot errors that may have led to variations in results or fallacious data. Exercises include the math, biology, and chemistry needed to develop proficiency in designing experiments and in collecting, analyzing, interpreting, and applying the resulting data. A comprehensive treatment of volume and mass measurements, solution and media preparation, cell culture, DNA isolation and analysis, protein isolation and analysis, assay development, recombinant DNA and transformations, scale-up, protein purification, quality control, DNA synthesis, PCR, and DNA sequencing is provided.

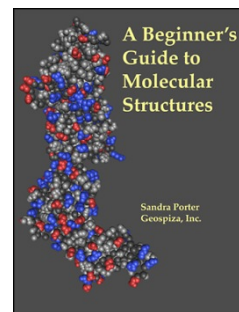
A Beginner's Guide to Molecular Structures, by **Sandra Porter**

ISBN-0976384639

Publisher: Geospiza

Paperback Wire-O binding, 200 pp

Pub. Date: August, 2007



Learning genetics and biochemistry is much easier when you can really see how mutations change the shapes of structures. Engaging activities help you learn and practice what you've learned. This manual will show you how you can use software to work with molecular structures, all freely available from the National Center for Biotechnology Information (NCBI). Not only are molecular structures a wonderful learning tool, they're entertaining too.

This guide shows you how to:

1. Find structures of proteins and DNA,
2. Determine which structure is which,
3. Draw and color structures in different ways, and
4. Compare structures with each other to see the effects of mutations.

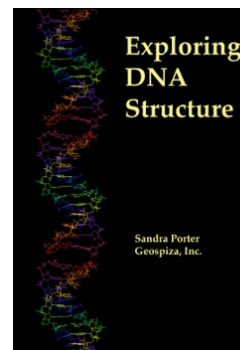
Exploring DNA Structure, by Sandra Porter

ISBN-0976384604

Publisher: Geospiza

Paperback Wire-O binding, 93 pp

Pub. Date: April, 2005



Learning genetics and biochemistry is much easier when you can really see how mutations change the shapes of structures. Engaging activities help you learn and practice what you've learned. This manual will show you how you can use software to work with molecular structures, all freely available from the National Center for Biotechnology Information (NCBI). Not only are molecular structures a wonderful learning tool, they're entertaining too.

This guide shows you how to:

1. Find structures of proteins and DNA,
2. Determine which structure is which,
3. Draw and color structures in different ways, and
4. Compare structures with each other to see the effects of mutations.

This manual is designed to accompany the "Exploring DNA Structure" CD; however it can be used as a stand-alone guide for working with any DNA structures obtained from the Molecular Modeling database at the National Center for Biotechnology Information (NCBI). Over 600 students and teachers from universities, community colleges, and high schools, have thoroughly tested and reviewed the activities in this manual and the accompanying CD.

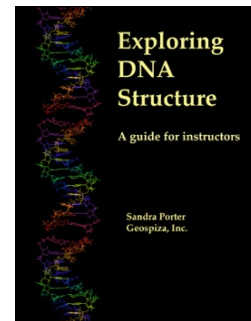
Exploring DNA Structure: A guide for instructors, by Sandra Porter

ISBN: 0976384620

Publisher: Geospiza

Paperback Wire-O binding, 190 pp

Pub. Date: November, 2005



Your students can explore the structure of DNA through the wonder of digital biology and learn how to use molecular modeling tools at the same time. The instructor guide contains:

- answer keys for all the activities,
- quizzes that can be used a pre- and post tests, and answer keys for the quizzes,
- implementation ideas,
- assessment suggestions,
- tables showing alignment with the National Science Education Standards,
- and references, images, and descriptions for all 70 structures on the Exploring DNA Structure CD,
- plus all the material in the student version of the text,
- and on-line materials, too! The on-line site contains powerpoint slides and color images.

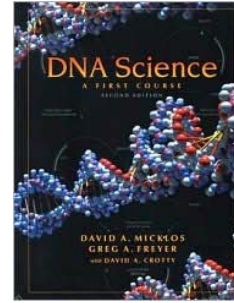
DNA Science: A First Course, (2nd Edition), by David Micklos & Greg A. Freyer

ISBN-13: 978-0879696368

Publisher: Cold Spring Harbor Laboratory Press

Hardcover, 500 pp

Pub. Date: January, 2003



Proven through more than 10 years' of teaching at research and nonresearch colleges and universities, junior colleges, community colleges, and advanced biology programs in high school, this book has been successfully integrated into introductory biology, general biology, genetics, microbiology, cell biology, molecular genetics, and molecular biology courses.

The first eight chapters have been completely revised, extensively rewritten, and updated. The new coverage extends to the completion of the draft sequence of the human genome and the enormous impact these and other sequence data are having on medicine, research, and our view of human evolution. All sections on the concepts and techniques of molecular biology have been updated to reflect the current state of laboratory research.

The laboratory experiments cover basic techniques of gene isolation and analysis, honed by over 10 years of classroom use to be thoroughly reliable, even in the hands of teachers and students with no prior experience. Extensive prelab notes at the beginning of each experiment explain how to schedule and prepare, while flow charts and icons make the protocols easy to follow.

***Engineering and Technology*, by Michael Hacker, David Burghardt, Linnea Fletcher, Anthony Gordon, and William Peruzzi**

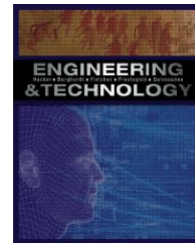
ISBN-13: 978-1418073893

ISBN-10: 141807389X

Publisher: Delmar Cengage Learning

Hardcover: 624 pages

Pub. Date: March, 2008



Driven by the Standards for Technological Literacy, this National Science Foundation-sponsored book is written by national leaders in engineering and technology education and addresses the most contemporary technological content using engaging, pedagogically sound "informed design" activities. This unique approach encourages students to develop a thorough understanding of engineering and technology before they ever attempt to develop detailed design solutions. The activities present students with a design problem, and prompt students to begin the solution-finding process with research, inquiry, and analysis. Only after this important step can students begin to discuss specifications and constraints, propose alternatives, and select an optimal design. This process fosters a strong student-teacher discourse and cultivates language proficiency, both with the end result of enhancing student's overall knowledge. Testing, evaluation, and modifications are addressed next, followed by a communication of achievements in a class presentation and final design report. Woven throughout the text are passages that will acquaint students with the requirements, responsibilities, necessary personal attributes and attitudes, and educational pathways that will lead to success in the various technological areas.

BIOLOGY Volume 1: Chemistry, Cell Biology and Genetics, Volume 1,
(8th edition) by Peter Raven, George Johnson, Kenneth Mason, Jonathan
Losos, & Susan Singer

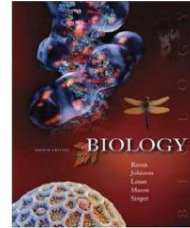
ISBN-13: 9780073337487

ISBN: 007333748X

Publisher: McGraw-Hill Companies

Paperback: 504 pp

Pub. Date: March, 2007



BIOLOGY is a leading authoritative majors textbook focusing on evolution as a unifying theme. Volume I covers Chemistry, Cell Biology, and Genetics; Volume II covers Plant and Animal Biology; and Volume III covers Evolution, Diversity, and Ecology. ***BIOLOGY*** is distinguished from other texts by its strong emphasis on natural selection and the evolutionary process that explains biodiversity. The new 8th edition continues that tradition and advances into modern biology by featuring the latest in cutting edge content reflective of the rapid advances in biology. That same modern perspective was brought into the completely new art program offering readers a dynamic, realistic, and accurate, visual program.

The graphics and online animations developed for this textbook are exceptional, and have been featured frequently in our online course offerings and module resources.