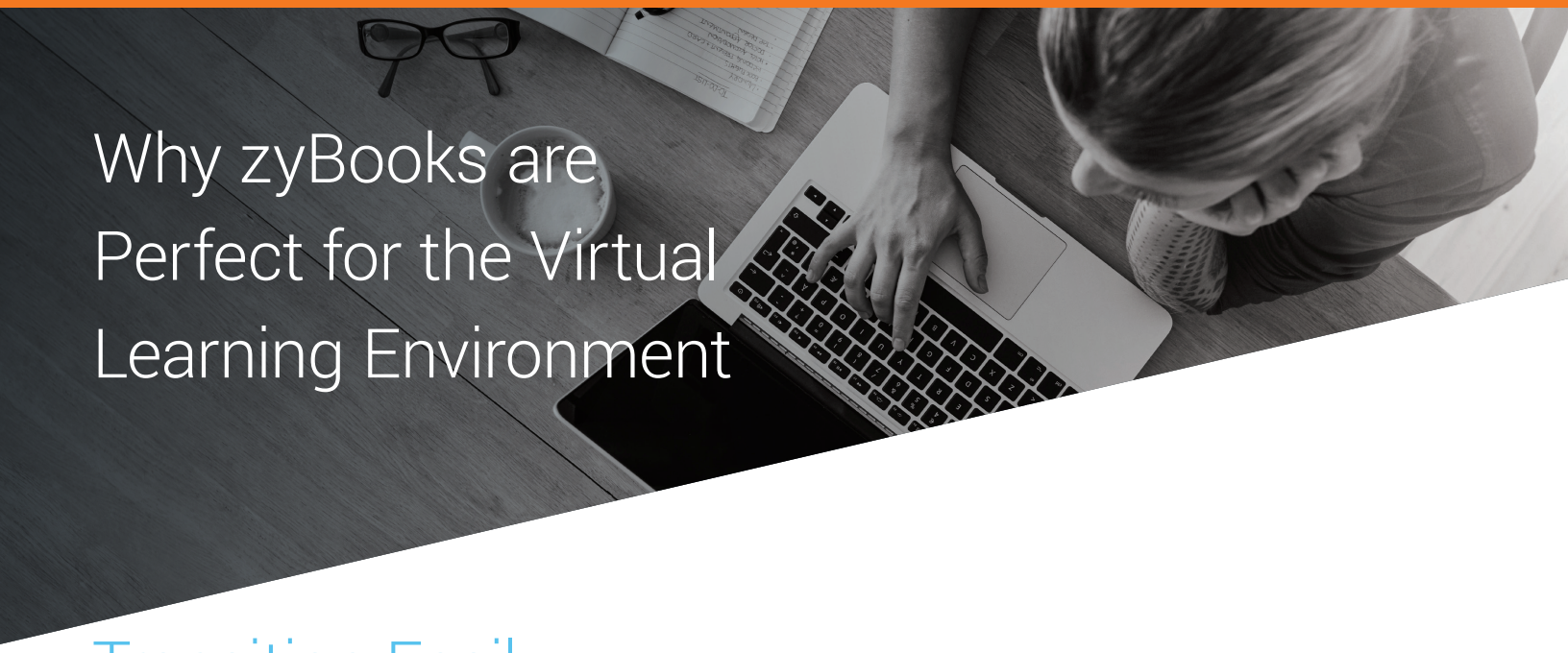
zyBooks

A Wiley Brand

2021 Catalog



Why zyBooks are Perfect for the Virtual Learning Environment

Transition Easily

While other digital learning solutions have steep learning curves and tedious setup processes, zyBooks are ready for you to use 'out of the box' with interactive content, question sets, animations, interactive tools, and integrated homework. You can even customize a zyBook with your own content. If you do need help, our top-notch customer support is here to get you up and running quickly and easily.

> *"zyBooks' support is routinely outstanding! Sarah and her team are responsive and quickly address any issues we encounter. [...] Really couldn't be happier with the zyBooks support team."*
>
> Professor Ian O'Toole, Valencia College

Boost Student Engagement

Keeping students engaged in a virtual environment is a challenge, but zyBooks' research-backed pedagogy of less text and more action immerses them in the subject matter. Students self-reported significantly higher levels of engagement and voluntarily spent twice as long with zyBooks compared to other options.

> *"It was so fun and easy to use. I found it to be an extremely effective tool for learning and keeping me engaged."*
>
> Mark B., Oklahoma State University

Foster Academic Integrity

Maintaining academic integrity is a priority. zyLabs help mitigate cheating through tools, such as the submission similarity checker, individual student coding trails, and exam time-gating. Detailed activity reports help you identify the topics where students are struggling and which students would benefit most from your support. With zyLabs, students don't cheat themselves out of learning.

Teaching STEM is hard

zyBooks makes it easier.

The data supports it. In one study, students using a zyBook showed a 16% improvement over students using a traditional textbook; and for the lowest performing students, zyBooks students outperformed other students by 64% (Figure 1). In another study, students learned 118% more in a single lesson with a zyBook than with traditional, text-heavy material (Figure 2). zyBooks equips teachers with just the right amount of content to optimize learning before, during, and after their classes. Students feel prepared, engaged, and confident.

Figure 1

Traditional Textbook vs. a zyBook

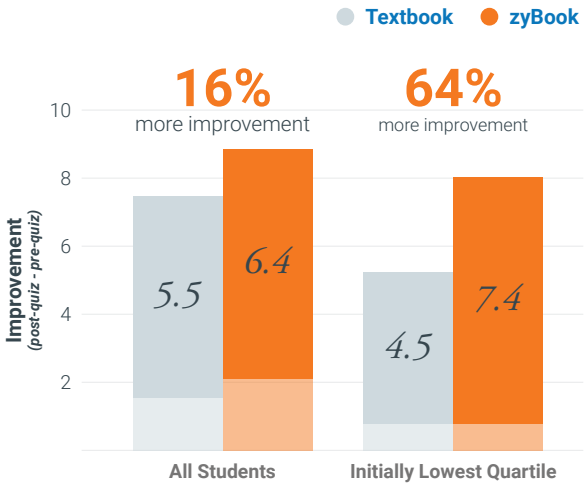
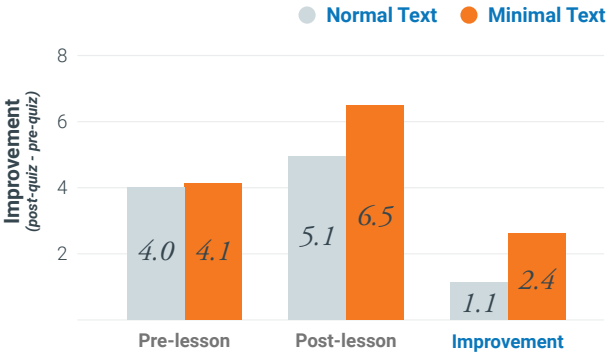


Figure 2

Quiz Scores



The zyBooks Vision

"'Students first, instructors a close second' is at the heart of our company, and that mission dramatically shapes the product experience."

Smita Bakshi,
zyBooks Co-founder and SVP, Technology, Engineering and Careers

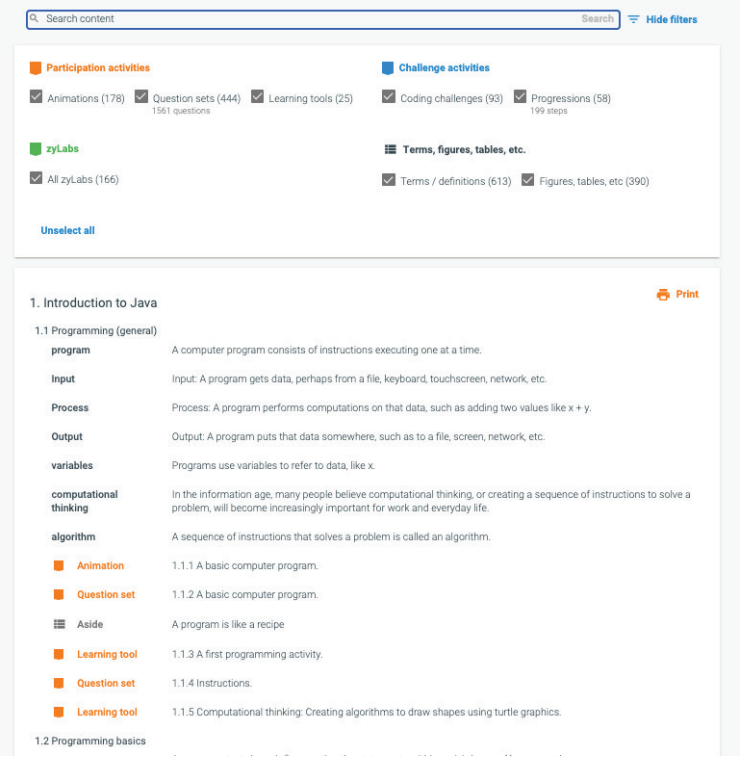
"With paper, text and figures were all we had. Today, we can create interactive content, so more students learn and thrive."

Professor Frank Vahid, (University of California, Riverside),
zyBooks Co-founder and Chief Learning Officer

The Challenge. Despite the ever-increasing global need for qualified STEM professionals, more than half of STEM students don't achieve their STEM degrees. Many students become discouraged by their early STEM classes, giving up on their dreams and prospects for rewarding, well-paying jobs. Part of the problem is the mismatch between traditional print texts retrofitted for the web and digitally native students.

The Opportunity. The real power of the web for teaching and learning — interactivity — has barely been tapped. The coronavirus pandemic has emphasized the need for learning tools that allow for quick conversions to a HyFlex format.

The Solution. We created zyBooks — STEM educational content built native for the web — using "less text, more action." Rather than long descriptions, zyBooks emphasize question sets, animations, interactive tools, and embedded homework. Students learn by doing, which many learning experts agree is the most effective educational strategy.



The Promise. Our authoring team creates and continually improves our zyBooks. We keep prices as low as possible, provide the best support we can, and make the zyBooks platform easy (and fun!) to use for students and instructors.

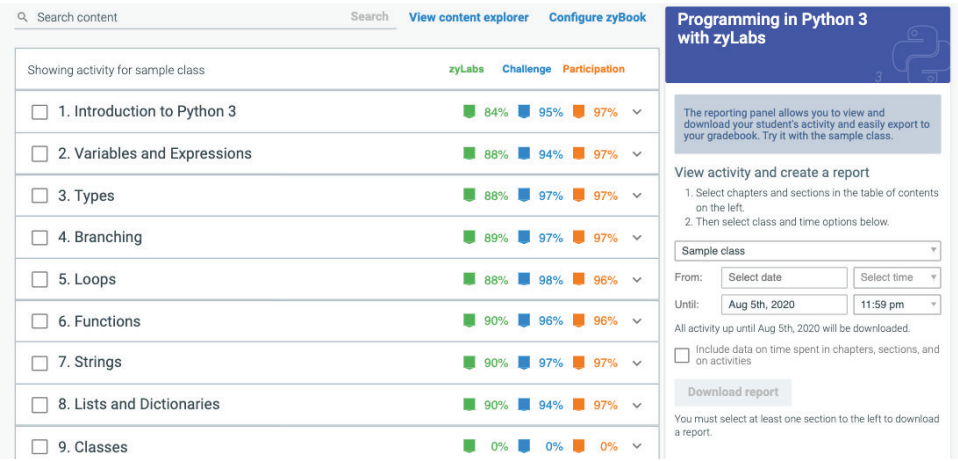
The Results. Starting with just a handful of universities in 2012, our computer science, engineering, math, and statistics zyBooks have been used by over 900,000 students and 5,000 instructors at more than 900 colleges and universities and dozens of forward-thinking high schools.

zyBooks Subjects

zyBooks are research-backed web-based **textbook** and **homework** replacements, making extensive use of animations, learning questions, and integrated tools.

- Programming in C
- Programming in C++
- Programming in Java
- Java Early Objects
- AP Computer Science A (Java)
- Programming in Python
- Introduction to MATLAB®
- zyLabs: Program Autograder
- Data Structures Essentials
- Data Structures Essentials with Python Examples
- Data Structures Essentials with Java Examples
- **NEW!** Data Structures Essentials With C++ Examples
- Database Systems with SQL
- Computing Technology for All
- Fundamental Programming Concepts
- Troubleshooting Basics – FREE
- Web Programming
- Mobile App Development with Android and Java
- Digital Design
- Operating Systems
- Computer Organization & Design (5e) - MIPS
- Computer Organization & Design (1e) – ARM
- Programming Embedded Systems
- Introduction to Computer Systems and Assembly Programming
- Linear Algebra
- Discrete Mathematics
- Quantitative Reasoning
- Algebra
- Precalculus
- Calculus Volume 1, 2 & 3
- **New!** Introduction to Statistical Investigations by Tintle/Chance et al.
- Applied Statistics with Data Analytics (R & Python)
- Applied Regression Analysis (R & Python)
- Spreadsheet Essentials
- NI Engineering Signals and Systems (2e)
- **New!** Control Systems Engineering - zyVersion of Nise
- NI Circuits (3e)
- Circuits (Calculus)
- Circuits (Algebra)
- **New!** Materials Science and Engineering - zyVersion of Callister
- Material and Energy Balances

Activity Reports: Insights into your students' progress and possible struggles



For this up to the minute reporting feature no initial set up is required . The report is a CSV file, which instructors can use to upload scores into a gradebook in Canvas, Blackboard, etc. Now a date and time range can be specified. Focusing on a certain window of time can be especially useful for using the auto-generated challenge activities for a "quiz" or giving credit for redoing a chapter. The new time spent data feature may give clues as to what topics or even activities could use extra attention during class.

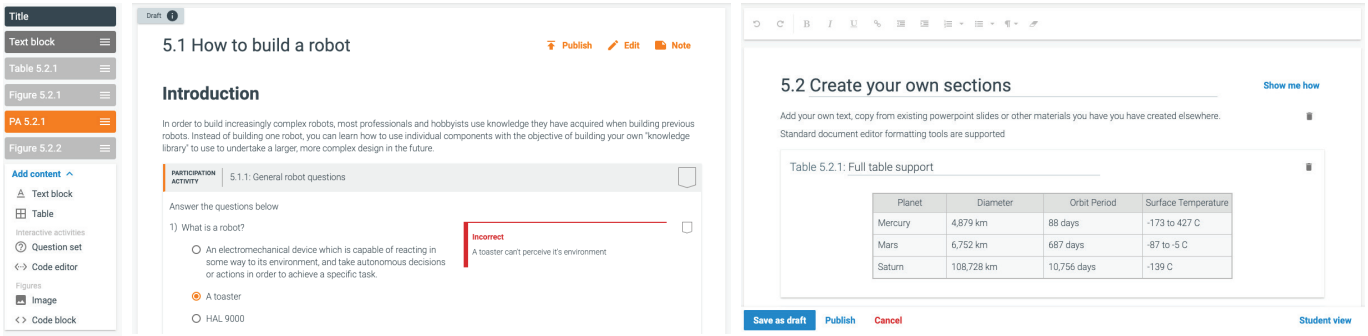
Author your own content to augment existing zyBooks sections

Copy in materials you may have in PowerPoint slides, PDFs, or other course materials. You can even add your syllabus as a section at the beginning of the zyBook. Adding your content directly to the zyBook makes it easy to centralize all resources you provide to students in one place with a similar look and feel.

Save your sections as drafts while creating and students won't be able to view them. Once finished, publish them for all students to access. The intuitive editing environment makes it easy to add, rearrange, and modify your sections. A student preview button allows you to view your section exactly as a student will before publishing.

You maintain ownership over all content you author and your sections will be carried over to new class zyBooks when you adopt for future terms. Please note that existing zyBooks-authored content remains uneditable.

Supported content types include text blocks with standard formatting tools such as bold, italics, underline, various list types, and more. Learning question sets allow you to write your own multiple choice and true/false participation activities and provide feedback to students as to why answers are correct or incorrect. Example blocks of code and images may be added as figures and formatted tables allow you to present tabular data effectively. You can also embed a video.

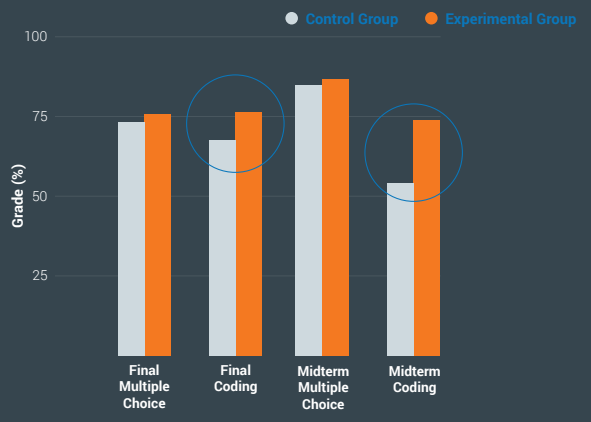


Program Autograder

Feedback is an important component of learning how to write code in a programming language. With zyBooks program autograder (zyLabs), students receive immediate feedback detailing whether the code is functioning correctly. Highlighted portions of compared output tests show learners where their output differs from what is expected, and unit tests ensure that functions/methods return the correct values. This feedback allows learners to edit, retest, and resubmit the code until the program works as expected.

One large program or many small programs?

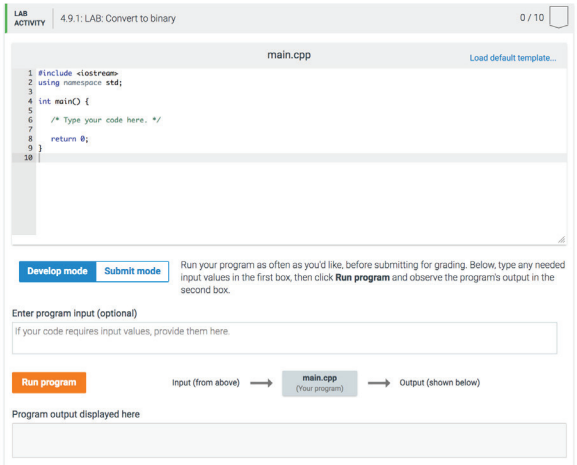
Our program autograder (zyLabs) simplifies creating and grading programming assignments, and gives students immediate feedback. Some instructors maintain their practice of assigning one large program (OLP) as part of a weekly assignment. Others create and assign 5-10 small programs, also known as many small programs (MSPs) each week. Research has shown that the MSP approach leads to less-stressed and more confident students who perform as well or better than students using the OLP method, even in CS2.



For more details on our studies visit: zyBooks.com/research

zyBooks maintained labs

Create your own programs right in zyLabs or use the large collection of labs that are authored and maintained by zyBooks staff. zyBooks maintained labs receive continuous improvements, bug fixes, and occasional updates to discourage code sharing.



zyLabs Enhancements

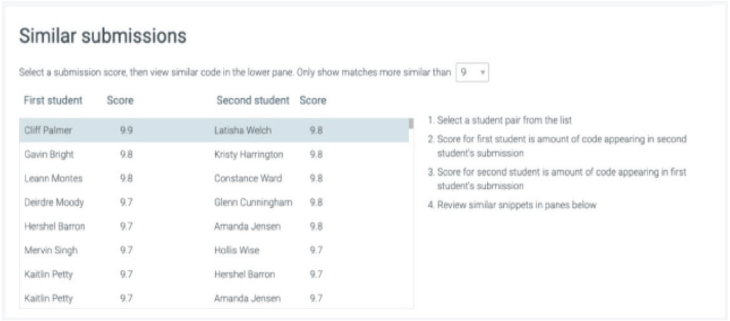
Time-gating

You can hide a zyLab and then specify (1) a start time, after which the exam will be accessible to the student, and (2) a stop time, at which time the lab automatically becomes hidden again, removing the student from the lab. Students will see visual indications of time remaining with 30, 10, 5, and 1 minute remaining. This feature can be especially useful for timed quizzes or exams.

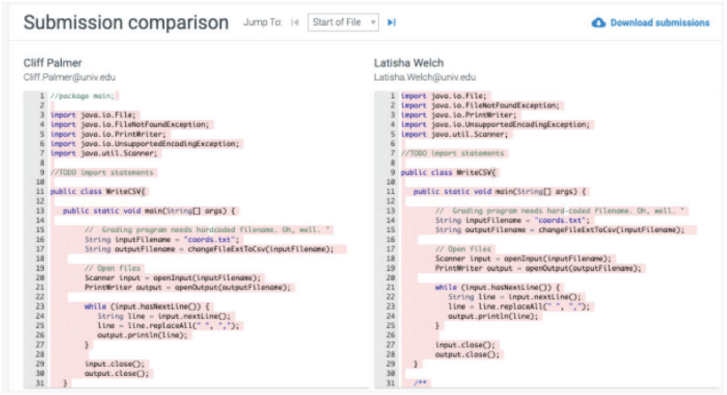
zyLab similarity check

Instructors often cite concerns about inappropriate collaboration among students on programming assignments. The SimChecker is an easy to use zyLabs **integrated** report* that helps identify similar submissions within a class zyBook, for instructors to examine further. Similarity between submissions is determined using a proprietary winnowing system, similar to the algorithm utilized by MOSS. Similarity checking looks beyond common modifications like renaming variables, manipulating whitespace, and modifying comments.

*Currently not available for zyLabs for MATLAB®.



(The names above were auto-generated and do not represent real students).



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zyLabs Coding Trails

zyLabs coding trails compactly represent a student's zyLab activity. A coding trail is incrementally created as a student runs their code or submits for grading against zyLab test cases, depicting their effort. Seeing the system records effort, and knowing instructors can see such effort, students are less likely to copy/paste someone else's code. Coding trails are part of our goal to shift emphasis from cheat detection/punishment to cheat prevention, so students stay more focused on learning and instructors can stay focused on teaching.

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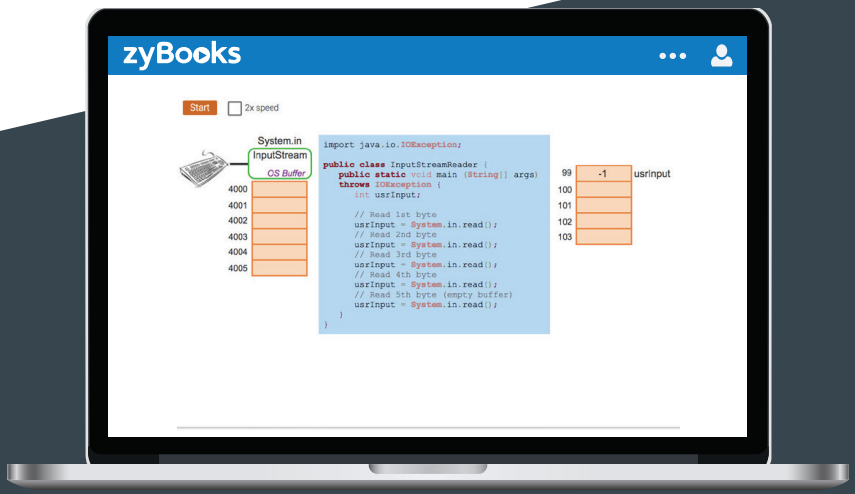
Computer Programming

Basic skill with a programming language is an educational foundation for a computer scientist, and increasingly every working professional. zyBooks take a strategic approach to presenting coding explanations, examples, and exercises. zyBooks users never get bogged down with too much reading before they see an animation that explains concepts far beyond what is possible with words. Participation and challenge activities follow, letting learners show how well they understand each topic.

- Participation activities, including questions, animations, and interactive tools
- Embedded coding environment with auto-graded programming challenge activities
- Focus on a solid understanding of memory usage, pointers, and arrays
- Configurable sections support early or late introduction to functions and objects
- Emphasis on incremental development, modular development, and testing/debugging



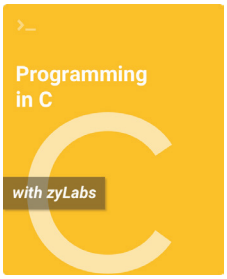
Out-of-the-box, ready to use 15-week (semester) and 10-week (quarter) configurations available for several core CS zyBooks

Available in:

C | C++ | Java | Python | MATLAB®

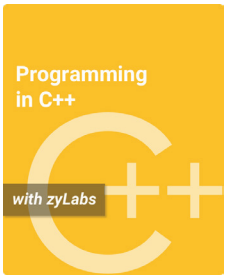
Computer Programming

- More than 550 participation activities each: animations, interactive learning questions and tools
- Over 100 auto-graded programming challenge activities each, using a built-in programming environment



Programming in C

- Includes focus on solid understanding of memory usage, pointers, and arrays
- Configurable sections support early/late introduction to functions
- Additional material includes modular compilation and engineering examples

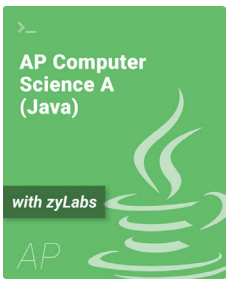


Programming in C++

- Includes focus on solid understanding of memory usage and pointers
- Configurable sections support early/late introduction to functions and objects
- Additional material includes arrays and structs
- Web-based programming practice environment compiles and executes code in the zyBook
- With test banks

Programming in Java

- Configurable sections support early and late introduction to methods and objects
- Additional material includes command-line arguments and engineering examples
- Java Early Objects version also available, both built-in and user-defined
- With test banks



AP Computer Science A (Java)

- Dozens of problems for practicing APCSA exam questions
- Configurable sections support early/late introduction to methods and objects
- Additional material includes engineering examples and Javadocs

Programming in Python

- ~600 participation activities: animations, interactive learning questions and tools
- ~100 auto-graded programming challenge activities using built-in programming environment
- Configurable for high schools and non-majors
- With test banks

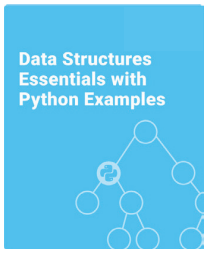
Computer Programming

Data Structures Essentials

- Emphasizes essential data structures and algorithms
- Animations and tools are an excellent match for teaching data structures
- Language-independent pseudocode for data structures to ensure mastery of the fundamental concepts
- With test banks

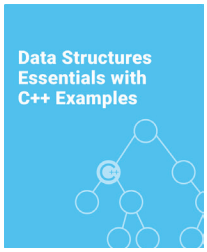
Data Structures Essentials with Java Examples

- This zyBook features highly visual and interactive content, bringing the world of data structures to life
- Pseudocode is used to teach essential data structures and algorithms to help the reader master the fundamental concepts
- Java-specific sections are also included, providing Java implementations of many of the data structures and algorithms
- Over 40 challenge activities are included to provide extra practice for students. Each is auto-graded and features randomly-generated content
- Test banks are also included for every section



Data Structures Essentials with Python Examples

- Uses pseudocode to teach essential data structures and algorithms, helping readers master the fundamental concepts
- Python-specific sections are also included, providing Python implementations of many of the data structures and algorithms
- Animations and tools are an excellent match for teaching data structures
- Includes test banks



NEW! Data Structures Essentials With C++ Examples

- This zyBook features highly visual and interactive content, bringing the world of data structures to life
- C++ specific sections are also included, providing C++ implementations of many of the data structures and algorithms
- Test banks are also included for every section

Introduction to MATLAB®

- Strong emphasis on array operations
- 700+ participation and challenge activities: animations, interactive learning questions and tools
- Homework system including partial credit
- MATLAB® zyLabs include downloadable student submissions
- With test banks

Program Autograder (zyLabs)

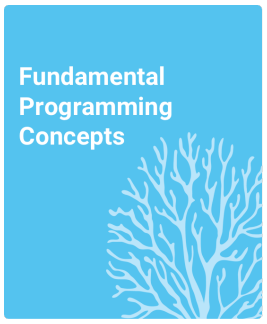
- Free sample labs available in Java, Python, C, C++, or Web Programming
- Simple form-based creation. No scripting required
- Supports I/O and unit testing
- Configurable options include submission limits, metering, and more
- Auto-graded labs seamlessly integrate with instructor dashboard and gradebook

Fundamentals of Computing

Beginning computer science coursework is daunting for some students. Not every student is ready to jump straight into CS1. zyBooks offers exceptionally approachable material for CS0 courses that provides real insights, experiences, practical skills, and programming fundamentals for computing technology.

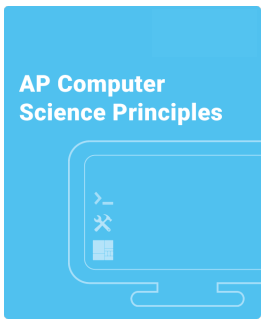
Computing Technology for All

- Real insights, experiences, and practical skills
- Plentiful animations and interactive question sets
- Built-in tools to enable interactive experiences with Python, HTML, CSS, Javascript, and more
- With Test Banks



Fundamental Programming Concepts

- Exceptional approach to programming concepts, using flowcharts to teach basic programming concepts including variables, arithmetic operations, decisions, loops, arrays, and functions
- New ultra-simple programming language, Coral, includes unified flowcharts and code versions. Coral also comes with a free web-based educational simulator
- Basic troubleshooting techniques, and overviews of design methods including waterfall and agile design processes, UML, libraries, and more



AP Computer Science Principles

- Presents a highly interactive overview of the AP Computer Science Principles' big ideas: Creativity, Abstraction, Data and Information, Algorithms, Programming, The Internet, and Global Impact.
- Initially uses flowcharts to teach basic programming concepts.
- Uses a new, ultra-simple programming language, Coral, featuring a unified flowchart and code version and coming with a free web-based educational simulator.

Additional Programming Applications

Database Systems with SQL

This zyBook provides a highly interactive introduction to databases. Topics include database theory, architecture, design, and programming.

- The emphasis is on relational databases, but the material also covers NoSQL databases
- Features a comprehensive tutorial on the SQL language
- Includes hundreds of animations, learning questions, programming exercises, and automatically graded homework. With zyLabs!
- Multiple-choice test questions, suitable for formal exams, are available to instructors

Troubleshooting

- Short and systematic approach to troubleshooting process
- Basic debugging (using a simple programming language) with multiple real-world examples
- Debugging examples illustrate common calculation, logic, loop, and function errors

Web Programming with zyLabs

- Highly interactive intro to web programming using HTML5 standard
- Numerous animations and interactive question sets
- Topics include HTML, CSS, JavaScript, Ajax, Mobile web, Node.js, databases
- Introduces full-stack development of web applications
- Web programming concepts covered through over 150 seamlessly integrated, auto-generated and auto-graded challenge questions
- With test banks

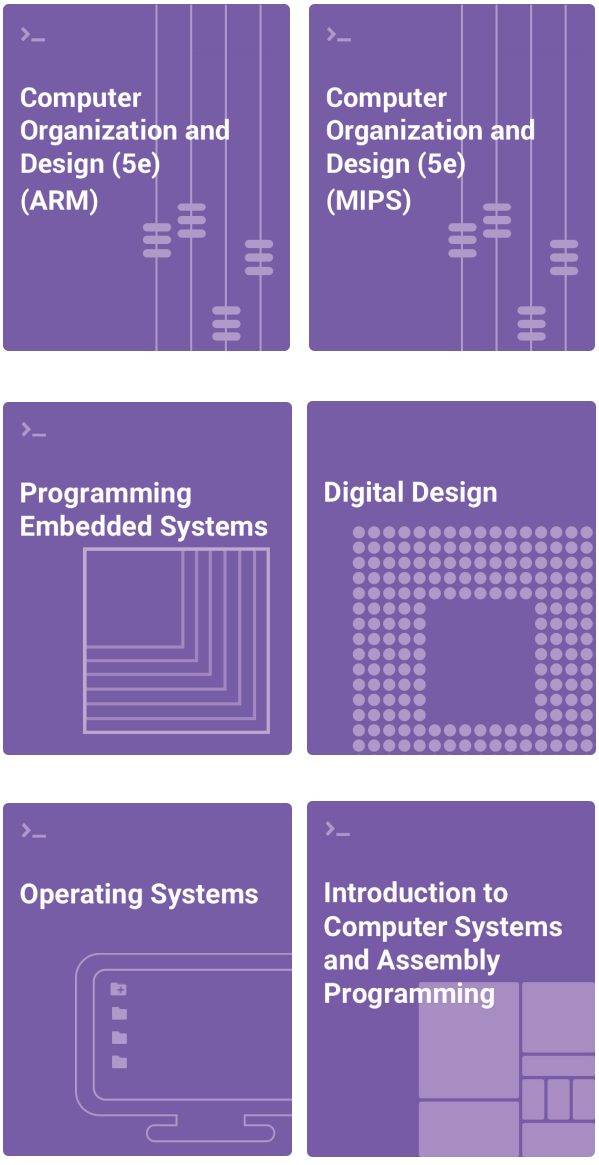
Mobile App Development with Android and Java

- Updates address recent changes to the Android platform, supporting Android Studio version 4.0 and API level 30
- Provides a highly-interactive introduction to Mobile App Development
- Topics include user interface components, fragments, application resources, and sensors
- 300+ participation activities: Animations and question sets
- With test banks

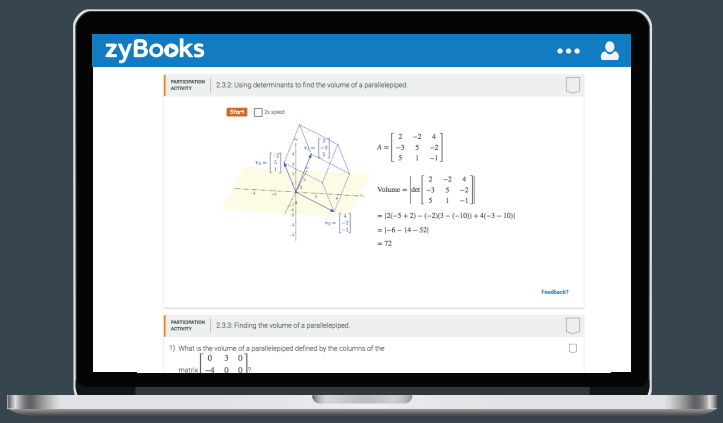
Computing Systems and Hardware

Many teachers realize that understanding how computers work help learners become more effective and confident programmers. The study of computing involves both learning programming and learning about computer hardware and systems. zyBooks offers products that teach the relationship between computer hardware and software. The zyBooks use a highly iterative approach with numerous animations, learning questions, and web-based simulators to teach complex topics.

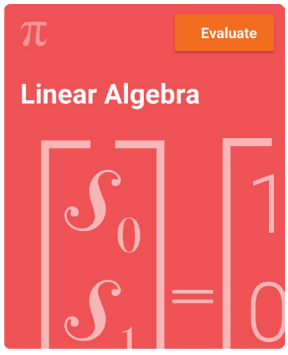
- Computer Organization and Design - ARM or MIPS by Patterson and Hennessy
- Assembly programming using simple and practical 12-instruction MIPS subset called MIPSzy; includes a built-in MIPSzy simulator
- Operating Systems provides insight into the underlying relationship between the software and hardware; includes processes, threads,resources, scheduling, concurrency, memory management, file systems, I/O, and security, with Test Bank available
- Computer Systems and Assembly Programming is an exceptionally approachable introduction to computer organization
- Digital Design emphasizes a top-down behavior-to-circuits approach, for combinational, sequential, and high-level (register-transfer-level) design, with Test Bank available
- Programming Embedded Systems teaches embedded programming, emphasizing concurrent synchronous state machines for robust real-time programming

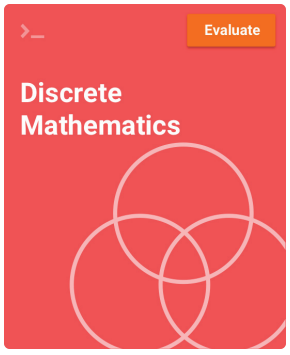


Math for Computer Science & Engineering



Many courses in computer science and engineering require a solid understanding of discrete math and linear algebra. Discrete math is the study of finite and countable sets, logical reasoning, algorithms, and counting. Similar to how calculus is the mathematical foundation for many physical sciences, discrete mathematics forms the foundation for much of computer science, and is often required for more advanced study in computer science. Many real-world phenomena in the fields of engineering, physics, chemistry, and social sciences can be modeled using linear equations. In contrast to discrete mathematics, many objects studied in linear algebra are continuous. Linear algebra provides a natural extension of concepts introduced elementary algebra.





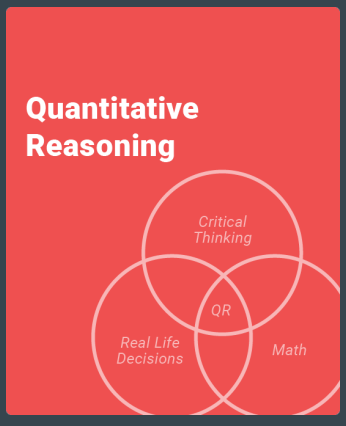
Available as out-of-the-box 10- or 15-week configuration

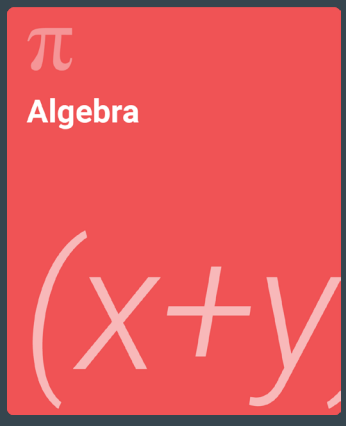
- Practical examples of applications in computer graphics, physics, circuits, cryptography, and graphs
- Numerous animations and interactive question sets
- Seamlessly integrated auto-generated and auto-graded challenge activities
- Hundreds of end-of-section exercises
- With Test Banks

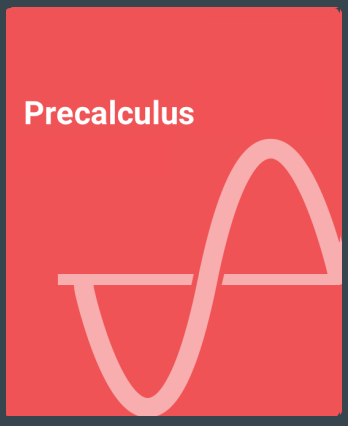
Get a free evaluation copy here

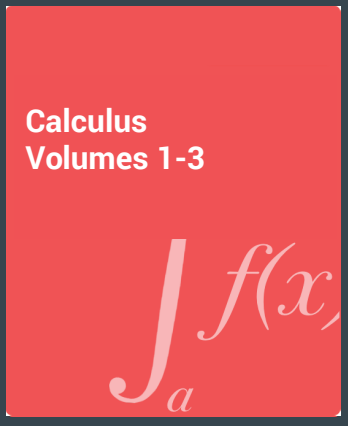
General Mathematics

Mathematics is often an obstacle for students pursuing careers in engineering or information technology, making it even more vital to present this material in a clear, compelling, and concise way. zyBooks offers highly engaging material for learning algebra (with Test Banks), precalculus, calculus (1, 2, and 3), and statistics. Concepts are taught through as little text and as many animations and learning questions as possible. Animations provide tremendous insight into mathematics related topics, greatly aiding student understanding. Learning questions help students thoroughly understand the material through carefully created incremental steps that not only keep students engaged, but provide thorough explanations of both right and wrong answers.









Tintle/Chance et al.'s Introduction to Statistical Investigations

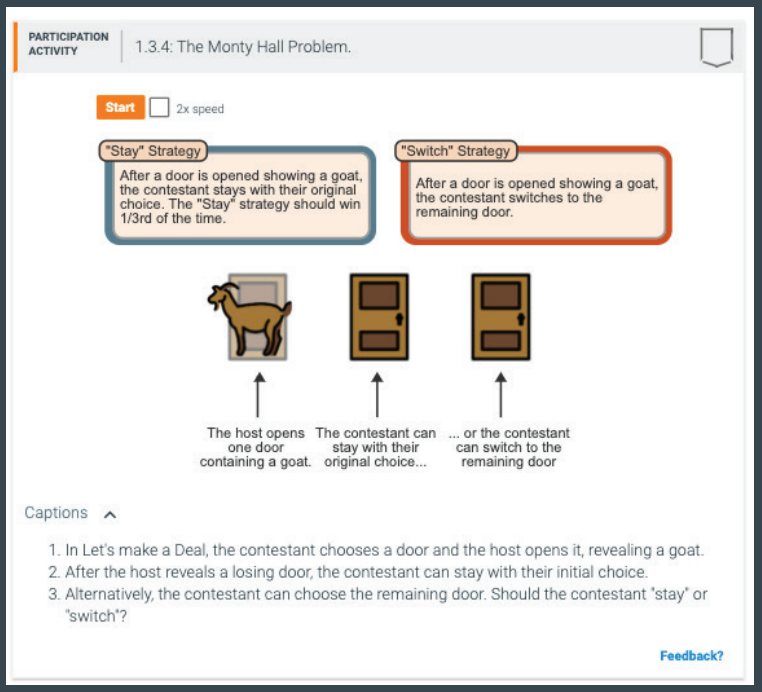
Bring the second edition of *Tintle/Chance et al.'s Introduction to Statistical Investigations* to life through zyBooks' interactive learning platform.

Built from the ground up using zyBooks' pedagogy and in close collaboration with the authors, the *Introduction to Statistical Investigations* zyBook takes the authors' spiral approach to the statistical process into a new experiential paradigm. Rather than passively reading along as the authors apply their approach to worked examples, students interact with zyBooks' guided animations, simulation tools, and learning questions with answer-specific feedback. By manipulating real-world data and drawing conclusions through these interactive tools, students become immersed in the process of "doing statistics," which builds confidence and empowers success.

Each chapter follows a coherent six-step statistical exploration and investigation method (ask a research question, design a study, explore the data, draw inferences, formulate conclusions, and look back and ahead) enabling students to assess a variety of concepts in a single assignment. This method is enhanced and reinforced through zyBooks' interactive tools. In addition, Challenge Activities provide higher stakes evaluations for each section while a Test Bank extends assessment opportunities.

Introduction to Statistical Investigations Continued

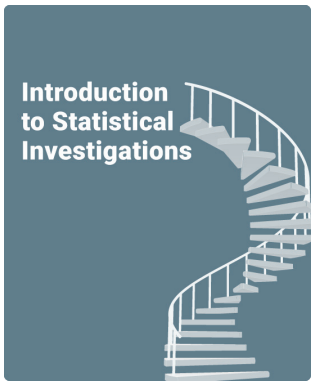
The zyBook is designed with flexibility for on-campus, hybrid, or fully online courses. It can be integrated with your campus LMS and can be customized to support and enhance your teaching. Any part of the zyBook is assignable for credit, and all student engagement with the learning content is recorded for your review and analysis. Your students can print their zyBooks content in pdf format.



"Best Monty Hall simulation I have ever seen."
Professor Rick Pugsley, Ivy Tech Community College

For Fall 2021 Use

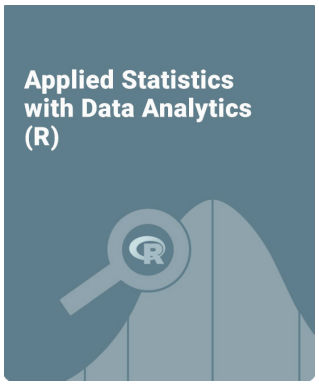
Statistics



NEW! Tintle/Chance et al.'s Introduction to Statistical Investigations

This iconic resource by Tintle/Chance has been built from the ground up with zyBook hands on pedagogy:

- Participation activities immerse students in the process of doing statistics: guided animations, simulation tools, and learning questions with answer-specific feedback
- Tintle's six-step statistical exploration and investigation method is enhanced and reinforced through zyBooks' interactive tools
- Test Bank extends assessment opportunities

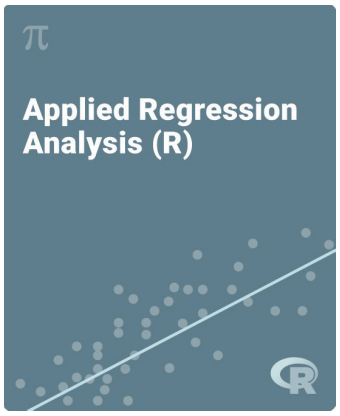


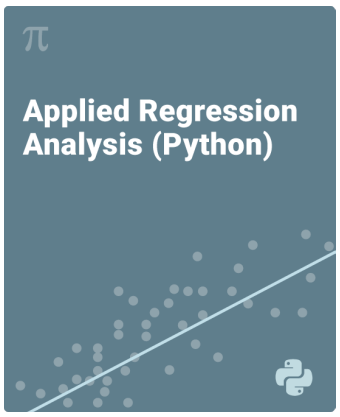
Applied Statistics with Data Analytics - for R or Python (with zyLabs)

These zyBooks provide a concise introduction to bivariate and multivariate statistics using an applied approach with real-world data. Equations for common statistical quantities are provided, but most concepts are explained using animations rather than rigorous mathematical proof. This content is recommended for STEM majors who may not have a solid foundation in statistics, but want a friendly introduction to data analytics. R or Python coding environments are provided that allow students to experiment with datasets that are both interesting and relevant to students' day-to-day lives.

- An exceptionally student-focused introduction to applied statistics
- Traditionally difficult topics are made easier using animations and learning questions
- Several chapters on data analytics and data mining algorithms are included
- Commonly combined with "Applied Regression Analysis" with numerous configurations possible
- With test banks

Statistics

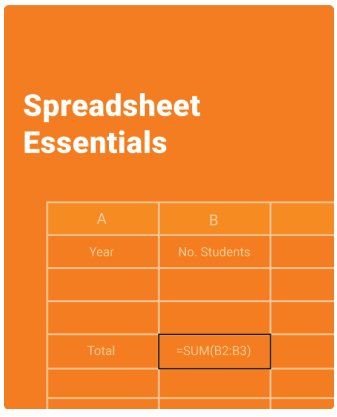




Applied Regression Analysis - for R or Python

This zyBook builds on the techniques introduced in linear regression and provides the tools needed to analyze the relationship between two or more variables. Ideal for students enrolled in a second applied statistics course, Applied Regression Analysis dives deeper into model selection and evaluation. The following questions are answered: Which variables should be included or removed to better predict the target variable? Are the conditions for a specific technique satisfied? Which transformations can be performed on the data when certain conditions are violated? Additional topics covered are:

- Time series
- Monte-Carlo methods
- Bootstrapping and randomization
- Non-parametric statistics
- With test banks



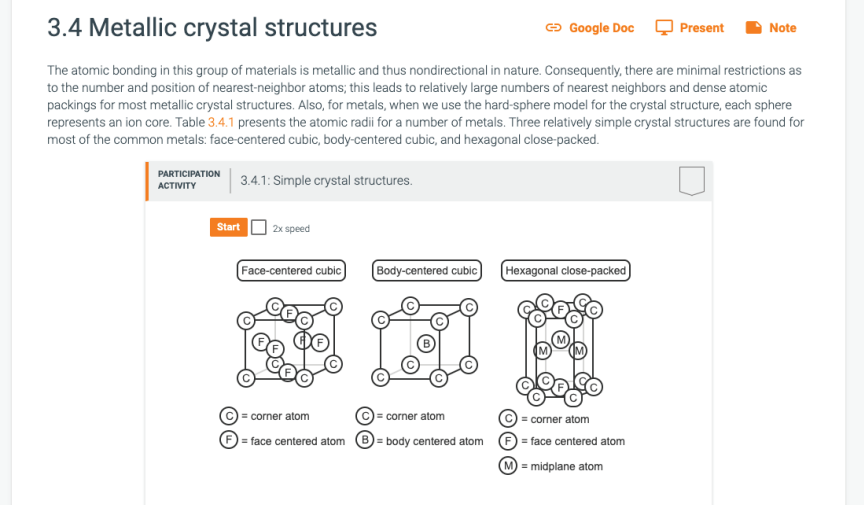
Spreadsheet Essentials

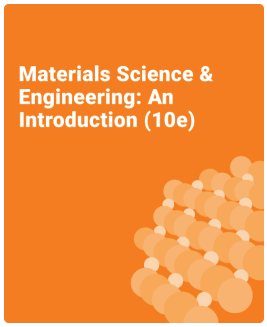
- A highly interactive tool on using spreadsheets in any discipline
- More than 40 animations demonstrate simple to advanced functions
- Over 120 auto-graded questions provide students practice with spreadsheets

zyVersions

Introducing zyVersions for Callister & Nise Titles

zyVersions are leading print titles converted and adapted to zyBooks' interactive learning platform, allowing for a quick and easy transition to an engaging digital experience for instructors and students.





Materials Science and Engineering: An Introduction, 10th Edition

By William D. Callister Jr. and David G. Rethwisch

Materials Science and Engineering: An Introduction promotes student understanding of the three primary types of materials (metals, ceramics, and polymers) and composites, as well as the relationships that exist between the structural elements of materials and their properties. Now available in a zyVersion, *Materials Science and Engineering* features:

- Approximately 100 animations
- Hundreds of learning questions to engage students
- Embedded Virtual Materials Science and Engineering (VMSE): a unique tool for visualizing and manipulating molecules in 3D with interactive simulations and animations

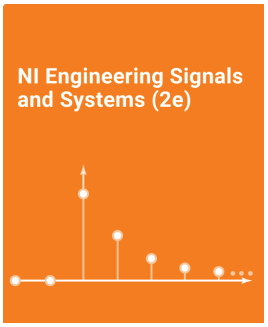
Control Systems Engineering, 8th Edition

By Norman S. Nise

Highly regarded for its accessibility and focus on practical applications, *Control Systems Engineering* offers students a comprehensive introduction to the design and analysis of feedback systems that support modern technology. Now available in a zyVersion, *Control Systems Engineering* features:

- Approximately 55 animations
- 125 participation activities
- MATLAB® & Simulink integrations

Electrical Engineering

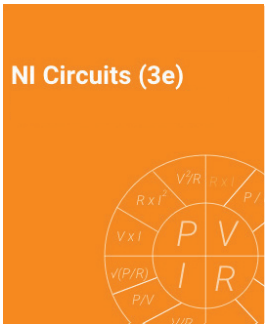


NI Engineering Signals and Systems (2e)

The NI Engineering Signals and Systems texts gets a new, interactive version as a zyBooks title for 2020. Applications of signals and systems for engineering are presented alongside concepts and mathematical models. Practice problems with fixed parameters allow students to practice more advanced problems and see different examples. Auto-graded challenge activities also help students practice solving problems with variables and increasing difficulty levels. Includes labs that encourage students to vary parameter values to clarify many of the examples and associated problem-solving assignments.

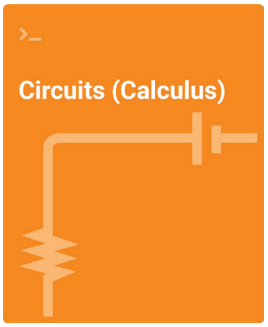
- 138 animations
- 52 challenge activities, with 234 levels
- 557 end of section exercises
- 1,678 learning questions

Linear circuit analysis introduces students to the theoretical concepts and practical applications of building and analyzing electrical circuits. zyBooks offers different circuits books to introduce these concepts in different environments. Animations help students visualize concepts like current flow, while interactive question sets help cement student understanding as concepts build upon each other.



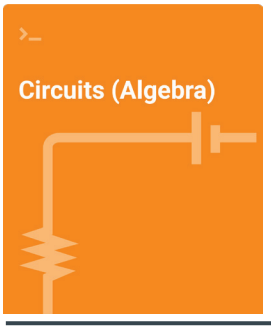
NI Circuits (3e)

- NI Circuits (3rd ed.) embeds hundreds of learning questions, converts various figures and examples into dynamic animations, and includes many additional challenge activities for all chapters
- Technology Brief sections describe everyday applications of circuit theories in fields such as medicine, optics, and more
- Multisim sections introduce students to NI's SPICE circuit simulator with additional problems to support laboratory experiences



Circuits (Calculus)

- Teaches the basics of linear circuit analysis using calculus, and is ideal for an introductory Circuits 1 course
- Concise text is interspersed with animations that further explore concepts that may be difficult to visualize
- Challenge activity question sets provide additional practice for students, as new circuit problems with different circuit configurations and component values are presented for students to analyze

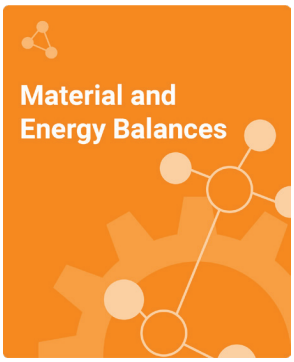


Circuits (Algebra)

- The basics of linear circuit analysis using algebra
- Concise text allows students to focus on the material without feeling bogged down
- Over 200 question sets increase student ability to conceptualize and understand circuits

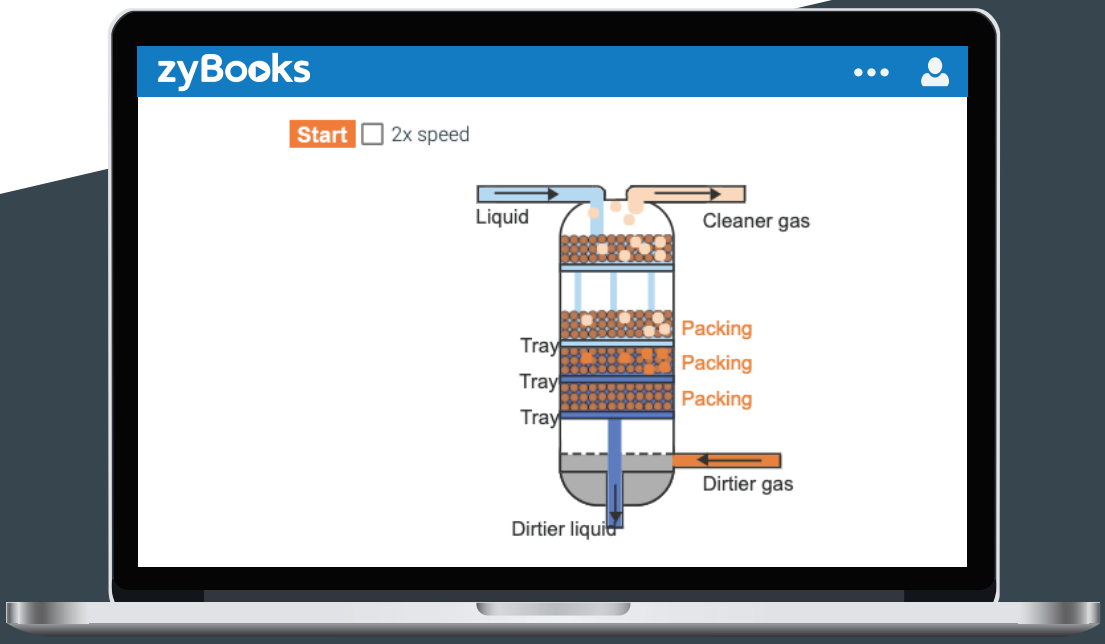
Chemical Engineering

Material and Energy Balances is a foundational course for chemical engineering students. This zyBook introduces how the basic concepts of mathematics, physics, and chemistry are applied to solving mass and energy balance problems through interactive question sets, animations, and learning tools. Problem solving skills are developed for systems containing chemical reactions, multiphase and vapor-liquid equilibria, and recycle streams. Students sketch process flow diagrams and calculate properties.



Material and Energy Balances

- Advanced topics include mass and energy balances for open, closed, transient, and reactive processes
- Over 500 auto-graded homework questions with rolling numbers and content, and over 100 animations and interactive tools
- More autograded challenge activities added to provide extra practice for students



Combining zyBooks + Add-ons

Student success is enhanced when they have access to meaningful and appropriate learning materials. With zyBooks, students don't need to buy content that you will not cover. Our pricing model allows you to create and assign the right zyBook for your class. Adopt one of our base zyBooks with the flexibility to customize the content to your class. Instructors often configure their own zyBook to combine a programming language with zyLabs, our program grader. Just a few chapters of an additional topic may be added to your desired zyBook. There are even volume discounts for multiple add-on components.

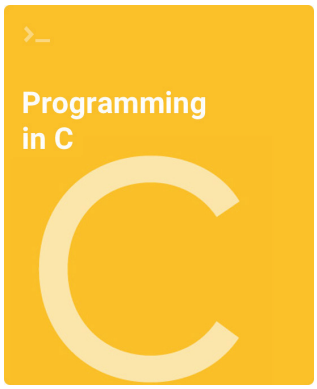
Base Price

Example: $58

Add-ons

One: $19

Two: $30



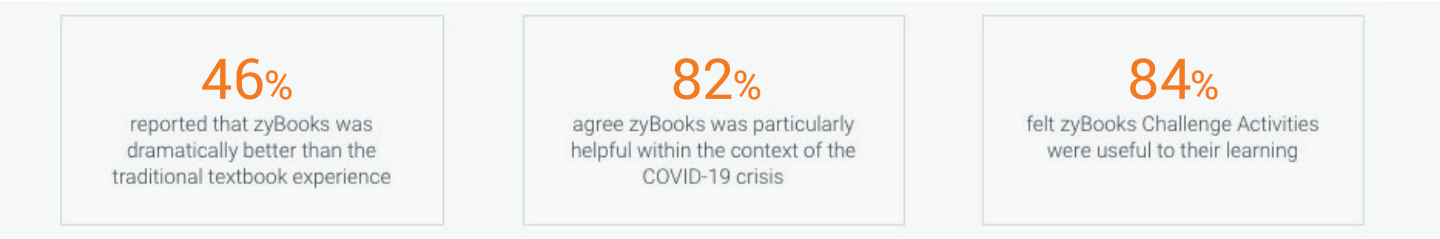
Three +: $10/**each**

$58	$77	$88	$98

This is only an example. Ask your Account Executive about additional options and pricing.

Testimonials

From our 2020 Spring Survey with 10,075 students polled, representing 300+ unique courses:



Alex Brooks is a software engineer with IBM Watson. He graduated in 2018 with a BS in computer engineering from the University of Arizona. Alex had a clear sense of what he wanted to do after college, but that didn't make the process any easier. "I planned out everything pretty early; I wanted to go into AI and machine learning since high school, so I built the coursework, research, and internships I did around that main goal," Alex told us. "I minored in both computer science and math to fill in any gaps."

> *"I feel more equipped than typical students coming out of college."*
>
> **Alex Brooks**, IBM Watson Software Engineer

"I found zyBooks the most useful for classes that involved a remote concept," he said. "With logic circuits, it's sort of nice to see examples of how the logic is actually propagating through the circuit because it's not always easy to look at it and immediately understand how it's going to work in all cases."

"In conventional textbooks and problem sets, if you have misconceptions as you're going through, those can accumulate by the time you get to the end of the chapter. zyBooks does a really good job of helping to correct those misconceptions as they're forming."

All of that planning and diligence paid off for Alex. Today, he is working with IBM Watson, exactly the space he had hoped to land. "I love my job; it's really cool," he shared.

He's surrounded by brilliant colleagues who teach him every day, but Alex is also confident in his background. He explained, "I feel more equipped than typical students coming out of college."

One of the more challenging courses to teach in an engineering discipline is computer programming. Focusing only on algorithms and programming blocks leaves little time to build a connection to daily engineering problems. On the other hand, teaching based on problem solving does not allow for a deeper comprehension of algorithm development. "Finding the right balance between these approaches was the issue that we had faced in the Cal Poly Pomona Aerospace Engineering Department for teaching MATLAB®," Dr. Navid Nakhjiri explains. "I decided to try a different approach."

> *"I decided to try a different approach."*
>
> **Dr. Navid Nakhjiri**, Cal Poly Pomona Aerospace Engineering Department

A traditional textbook cannot adequately engage the students in the process of learning. "No textbook could provide the level of student interaction I was hoping for, until I found the MATLAB® zyBook," he notes. The zyBook platform not only encourages the student to become an active learner; it also challenges the traditional learning environment with a focus on hands-on experience. "Cal Poly Pomona Aerospace Engineering is famous for its learn-by-doing approach. Why not use an innovative platform such as zyBooks to implement the same approach to teaching MATLAB® programming?" he suggests.

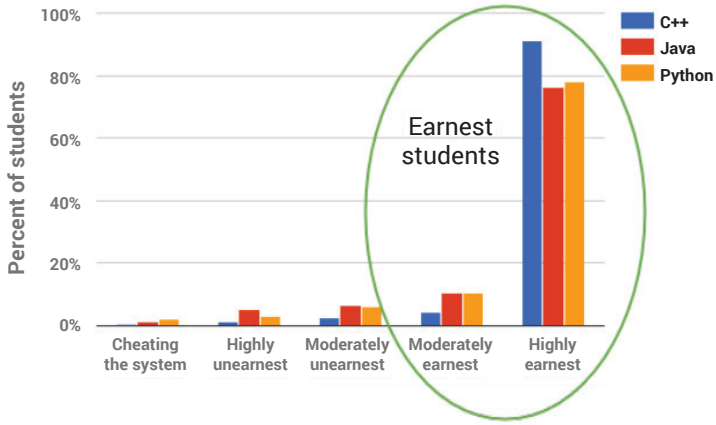
Backed By Research

Increases student earnestness

When using zyBooks, fewer than 2% of students blatantly "cheat the system." Despite the availability of the answer, the overwhelming majority of students will make an earnest attempt at completion.

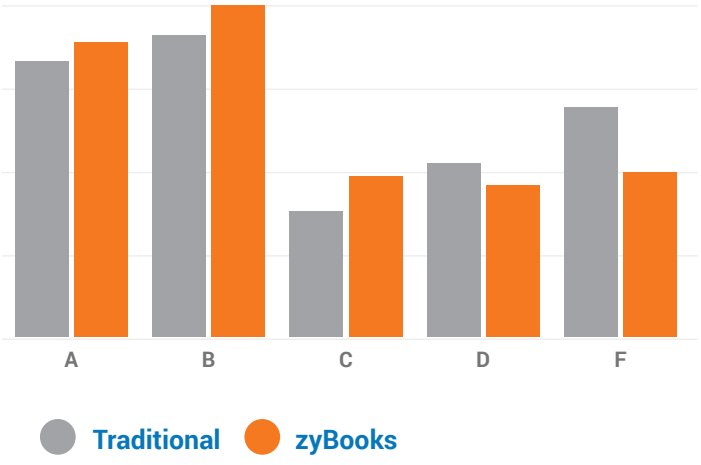
A. Edgcomb, F. Vahid, R. Lysecky, and S. Lysecky. Getting students to earnestly do reading, studying, and homework in an introductory programming class, *ACM SIGCSE Technical Symposium on Computer Science Education*, March 2017.

About 90% of students earnestly worked through the short answer questions. (723 students in total; 3 courses/universities)



Improves grades

In a comparison between students in the same course who switched from traditional textbooks to zyBooks (learning from the same instructor during the same semester), students using zyBooks received more As and Bs and fewer Ds and Fs.



zyBooks significantly improved exam and project grades across 4 courses at 3 universities (University of Michigan, University of Arizona, and UC Davis).

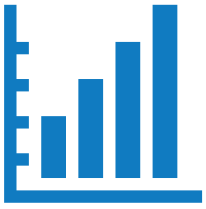
A. Edgcomb, F. Vahid. Effectiveness of Online Textbooks vs. Interactive Web-Native Content, *Proc. of ASEE Annual Conference*, Indianapolis, June 2014. (Best paper award)

Increases success in engineering courses

Used as sole textbook in Material and Energy Balances course.

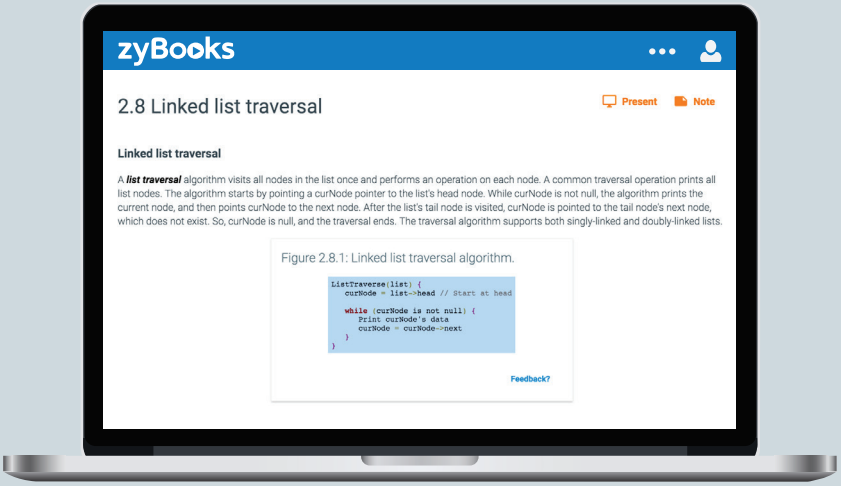
87% of students found the zyBook to be a useful textbook replacement.

Strong correlation between student success and zyBook engagement.



Liberatore MW (2017) High textbook reading rates when using an interactive textbook for a material and energy balances course. *Chemical Engineering Education*. 51(3): 109-118.

How It Works

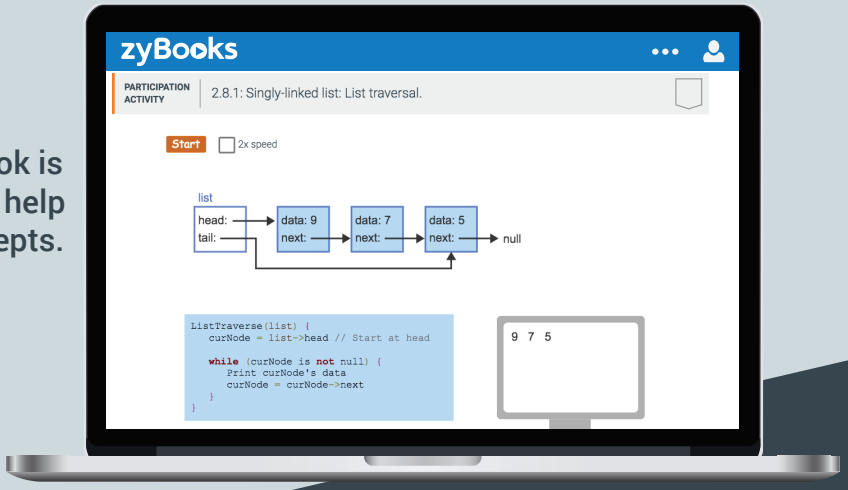


Say.

We use concise text as a jumping board to our animations and learning questions.

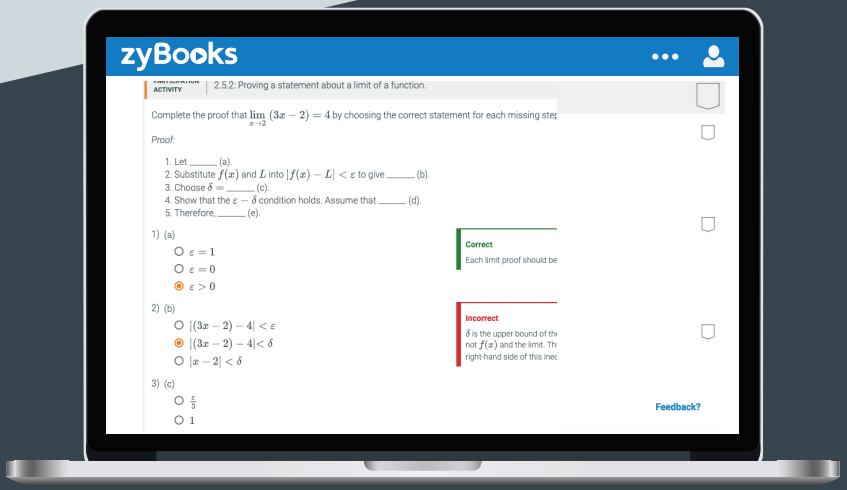
Show.

Much of a traditional textbook is replaced with animations to help students visualize key concepts.



Ask.

Learning questions and auto-graded homework problems encourage more student participation.



zyBooks

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Less text, more action.™

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