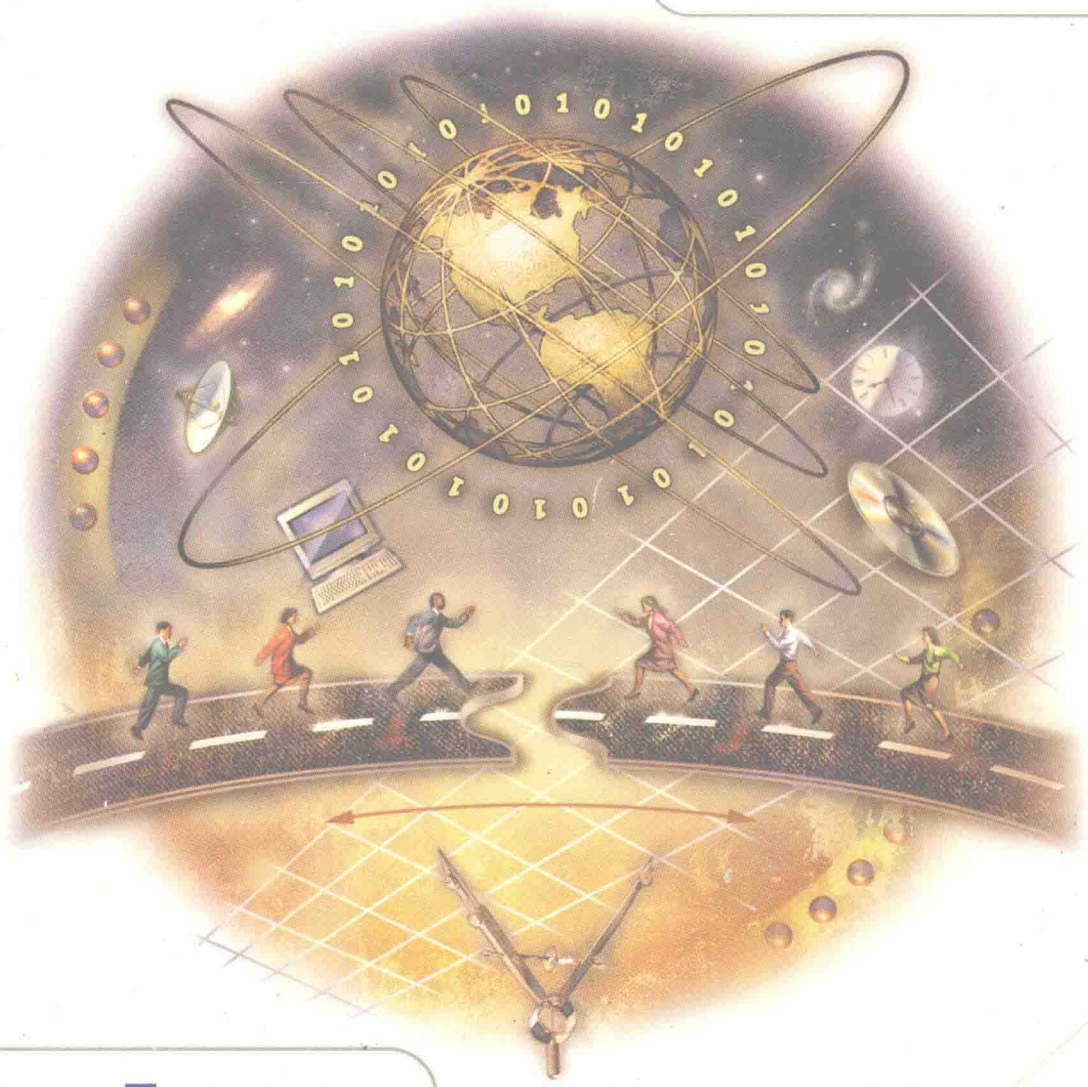
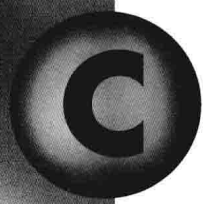
Computers

7th Edition



Larry Long

Nancy Long



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7th Edition

Larry Long

Nancy Long

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Cover Art: Cary Henrie

Library of Congress Cataloging in Publication Data
Long, Larry E.
Computers/Larry Long, Nancy Long.—7th edition
528pp.
ISBN 0–13–083190–5
1. Computers. 2. Electronic data processing. I. Long, Nancy
II. Title.
QA76.L576 1999
004—dc21 99–32131
CIP

Prentice Hall International (UK) Limited, London
Prentice Hall of Australia Pty. Limited, Sidney
Prentice Hall of Canada Inc., Toronto
Prentice Hall Hispanoamericano, S.A., Mexico
Prentice Hall of India Private Limited, New Delhi
Prentice Hall of Japan, Inc., Tokyo
Prentice Hall (Singapore) Pte. Ltd.
Editora Prentice Hall do Brasil, Ltda., Rio de Janeiro

Printed in the United States of America
10 9 8 7 6 5 4 3 2 1

Dedication

To our children,
Troy and Brady—
the motivation for all we do.

Preface to the Student

Welcome to the computer and information technology revolution. You've taken the first step toward information technology (IT) competency, the bridge to an amazing realm of adventure and discovery. Once you have read and understood the material in this text and have acquired some hands-on experience with computers, you will be poised to play an active role in this revolution.

- You'll be an intelligent consumer of PCs and related products.
- You'll be better prepared to travel the Internet and take advantage of its wealth of resources and services.
- You'll become a participant when conversations at work and school turn to computers and technology.
- You'll be better able to relate your computing and information processing needs to those who can help you.
- You'll know about a wide variety of software and services that can improve your productivity at work and at home, give you much needed information, expand your intellectual and cultural horizons, amaze you, your family, and your friends, and give you endless hours of enjoyment.

Achieving IT competency is the first step in a lifelong journey toward greater knowledge and interaction with more and better applications of IT. IT competency is your ticket to ride. Where you go, how fast you get there, and what you do when you arrive is up to you.

LEARNING AIDS

Computers is supported by a comprehensive learning assistance package that includes these helpful learning aids:

The Long and Long INTERNET BRIDGE

The Long and Long INTERNET BRIDGE at http://www.prenhall.com/long is a Companion Web site on the Internet that is accessible from any PC with Internet access. The site, which is designed to help you make the transition between textbook learning and real-world understanding, has a variety of learning aids, including these three main components.

- *Internet Exercises.* The INTERNET BRIDGE invites you to go online and explore the wonders of the Internet through a comprehensive set of Internet exercises. These entertaining exercises invite you to learn more about the topics in this book and to do some "serendipitous [just-for-fun] surfing."
- *Interactive Study Guide (ISG).* The INTERNET BRIDGE's comprehensive Interactive Study Guide gives you an opportunity to sharpen your problem-solving skills and to gauge your understanding of the material in the chapter. For each chapter, the ISG has multiple-choice, true/false, matching, and essay quizzes. The built-in grading feature gives you immediate feedback in the form of a report. The report also includes a question-by-question summary with an explanation or hint, your response, and the correct response (if needed).
- *Monthly Technology Update.* The printed book alone is no longer sufficient to keep you abreast of a rapidly advancing technology. The INTERNET

BRIDGE's Monthly Technology Update section helps you bridge this technology gap. Each month the authors post a chapter-by-chapter update to the INTERNET BRIDGE. The monthly update includes summaries of important technological events that occurred during the previous month.

The WEB icons in the margins throughout the book relate material in the book to applicable INTERNET BRIDGE exercises, *Interactive Study Guide* chapters, and technology updates.

WebCT.long: Distance Learning with Computers

WebCT.Long at http://www.prenhall.com/WebCT.long is a demo site for the optional online course for this information technology concepts book. The site lets you take computer competency courses via distance learning or allows you to enhance your classroom experience with online learning. That is, you logon to the *WebCT.long page* on the Internet to interact with instructors and classmates, go over chapter summaries, evaluate your understanding of course material, participate in online discussion groups, take quizzes and tests, gain access to class information (schedule, homework, and so on), make inquiries about your grades, and much more.

Computers, Seventh Edition, Interactive CD-ROM

An optional interactive version of the seventh edition of *Computers* integrates the book's content, a variety of learning tools, and access to the resources of the Internet on a CD-ROM. This electronic book makes it easy for you to navigate between computer and information technology topics in the book and various learning aids, including the interactive labs on the CD-ROM and the interactive Internet-based study guide.

YOU, COMPUTERS, AND THE FUTURE

Whether you are pursuing a career as an economist, a social worker, a politician, an attorney, a dancer, an accountant, a computer specialist, a sales manager, or virtually any other career, the knowledge you gain from this course ultimately will prove beneficial. Keep your course notes and your book; they will prove to be valuable references in other courses and in your career.

Even though computers are all around us, we are seeing only the tip of the information technology iceberg. You are entering the IT era in its infancy. Each class you attend and each page you turn will present a learning experience to help you advance one step closer to an understanding of how computers and IT are making the world a better place in which to live and work.

Preface to the Instructor

THE PARADIGM SHIFT

The rules are changing. The criteria by which we make decisions, the way we do things, and even what we do are changing dramatically. Affordable PCs with tremendous power can reach around the world via the Internet, a rapidly expanding worldwide network of computers. Each increment in PC power and Internet resources adds fuel to the personal computing phenomena, accelerating the pace of change. We are now members of an interconnected society where we can shop at online Wal-Mart Supercenters, research our family tree, take virtual tours of thousands of sites from the White House to the pyramids, take courses for college credit, and much, much more, all from a linked PC.

This paradigm shift is causing radical changes in all facets of society, including the way we teach and learn. We are entering a new era of education in which technology plays an increasingly significant role. This is especially true of introductory information technology courses where the integration of the technology is a natural extension of the learning process. After all, the best place to learn about computers is at the computer.

THE INTRO COURSE

The introductory IT course poses tremendous teaching challenges. To be effective, we must continually change our lecture style and even the vehicle by which we convey content and interact with students. Throughout the term we are continually changing hats. Sometimes we are historians. Much of the time we are scientists presenting technical material. On occasion we are sociologists commenting on social issues. In the same course we now toggle between lecture, lab, and, for some, distance learning via the Internet. If that's not enough, we teach an ever-increasing amount of material to students with a wide range of career objectives and technical abilities. We, and Prentice Hall, have done everything we can to help you meet this challenge.

Opportunity, challenge, and competition are forcing all of us to become IT-competent and to prepare ourselves for a more interconnected world. The seventh edition of *Computers,* its mixed-media components, and its ancillary materials provide a launch pad toward these objectives. The target course for this text and its teaching/learning system:

- *Provides overview coverage of computing/IT concepts and applications for introductory courses.* The seventh edition of *Computers* comes in three versions so that you can get the best fit for your course's educational objectives.
- *Accommodates students from a broad spectrum of disciplines and interests.*
- *May or may not include a laboratory component.* Prentice Hall offers an extensive array of optional learning resources for hands-on laboratories.

COMPUTERS, SEVENTH EDITION: A FAST-PACED INTRODUCTION TO THE WORLD OF COMPUTING

About 6 Internet years pass in one real-time year—the elapsed time between the sixth and seventh editions. This new edition is a major *technology update* intended to bring *Computers* abreast with a rampaging technology. For the past 17

years, your peers have told us that we consistently publish the most up-to-date IT concepts textbook. We take great pride in your confidence in us and are committed to presenting a current and forward-looking picture of IT innovations and issues. But, this seventh edition is much more than a technology update.

The seventh edition has been reorganized and largely rewritten. We have listened to your feedback and feel that this new edition strikes a good balance between *efficiency of presentation* and *content that holds the student's interest and invites learning*.

- *Efficient presentation.* To achieve our *efficiency-of-presentation* goal, we cover only material that is critical to general IT competency. We avoid dated concepts; we don't cover basic concepts from every angle; and we're careful not to present topics at depths inconsistent with introductory learning. We feel that students at this stage of their IT competency journey need a breadth of understanding that is applicable *today* and in the *future*. Also, we present only information that will have an impact on students' ability to cope with the IT revolution, avoiding superfluous information that might dampen students' interest in technology.
- *Interesting and inviting content.* The text and all supplements are written in a style that remains pedagogically sound while communicating the energy and excitement of IT to students. We used every writing tool and pedagogical technique in our arsenal to entice students to turn the page and learn more. Throughout the book we make learning about IT a very personal experience by relating terms or concepts to their personal and professional lives. Students make the effort to learn when they can see why it's important to them.

The seventh edition presents a body of knowledge that students need in order to become active participants in this exciting new era of technological innovation and application. The book's content runs the gamut from motherboard technologies, such as USB, to ethical issues, such as spam. Our guiding objective during the writing of the seventh edition was to impart this crucial and substantial body of information in a manner that can be absorbed, retained, and enjoyed.

NEW FEATURES IN THE SEVENTH EDITION OF *COMPUTERS*

The seventh edition reflects thousands of changes in content, style, organization, and presentation. Here's a summary of these changes:

- *Conversational writing style.* The book now "talks" to the student in a manner that is more consistent with their everyday conversation.
- *New design.* The seventh edition has a new "reader-friendly" face that is more inviting to today's students.
- *One less chapter and no appendices.* In keeping with the book's new fast-paced presentation, the book is slightly condensed to better fit the reality of what can be accomplished in a college course.
- *New chapter on Windows.* A whole chapter is devoted to "the Windows environment" to better present the interface and interactive concepts that are embodied in the Windows 9x/NT/2000 operating systems and most modern PC software.
- *Productivity software presentation streamlined.* The presentation of office suite–type applications is consolidated in a single chapter, rather than two, in which the focus is more on overall functionality than on operation.
- *"Why This Chapter Is Important to You" section.* A section that personalizes the students' learning experience begins each chapter.

- *Section self-checks.* Generally, the number of self-check questions for each chapter has doubled or tripled, and now they're conveniently placed at the end of each section. Self-Check answers follow Chapter 13.
- *All-new software screen captures.* All of the screen-capture images have been updated to reflect the latest releases and innovations in software.
- *Many new colorful photo images.* The photo images have been updated to give the student a better feel for state-of-the-art hardware and applications.
- *All-new online examples.* All of the many Internet and America Online examples have been updated.
- *Capacities and speeds updated.* The numbers for modems, disks, RAM, processors, printers, the Internet, and so on are updated to reflect 2000–2001.
- *Expanded coverage of the Internet.* The coverage of the Internet throughout the book reflects its increased presence in society and in our lives.
- *Currency-plus.* The seventh edition actually anticipates emerging technology. If it's current and it's within the IT-competency body of knowledge, it's in this book. It has the latest on the Internet: online publishing, portals, videophones, flaming, firewalls, extranets, spam, and more. The software is right out of the box: Office 2000 and many more innovative applications. The latest hardware is here, too: infrared ports, CD-RW, SuperDisk, iMac, Pentium III, and more. And, of course, it's current with the acronyms: USB, AGP, SDRAM, OLE, RAD, OOP, WPNG, DVD, and all the rest.

Even with all these changes, the seventh edition of *Computers* was written to enable a smooth, seamless transition for those colleges moving from the fifth or sixth edition to the seventh edition.

POPULAR FEATURES RETAINED IN THE SEVENTH EDITION

- *Applications oriented.* The continuing theme throughout the text is applications. Hundreds of applications are presented from online universities to telemedicine to robotics.
- *Readability.* All elements (photos, figures, sidebars, and so on) are integrated with the textual material to complement and reinforce learning.
- *Flexibility.* The text and its mixed-media teaching/learning system are organized to permit maximum flexibility in course design and in the selection, assignment, and presentation of material.
- *Analogies.* Analogies are used throughout the book to relate information technology concepts to concepts students already understand, such as airplanes (computer systems), audio CDs (random processing), and cars/parking lots (files/disks).
- *Colorful Focus on ITs.* The Focus on IT feature combines dynamic photos with an in-depth discussion of topics that are of interest to students, such as the history of computers, how chips are made, and how to buy a PC.
- *Walk-through illustrations.* Every attempt has been made to minimize conceptual navigation between the running text and figures. This was done by including relevant information within the figures in easy-to-follow numbered walk-throughs.
- *Mixed-media margin icons.* The WEB and PHitLAB (Computers Interactive Labs) icons in the margin point students to interactive multimedia learning resources on the INTERNET BRIDGE and the PHitLAB CD-ROM. The WEB icons invite students to check out the Monthly Technology Update, do applicable Internet exercises, and use the Interactive Study Guide to assess their grasp of the material. The PHitLAB icons identify applicable laboratory exercises that let students interactively explore IT concepts.

- *Chapter pedagogy*. Chapter organization and pedagogy are consistent throughout the text. Each chapter is prefaced by *Learning Objectives* and *Why This Chapter Is Important to You*. In the body of the chapter, all major headings are numbered. (1.1, 1.2, and so on) to facilitate selective assignments and to provide an easy cross-reference to all related material in the supplements. Important terms and phrases are highlighted in **boldface** type. Words and phrases to be emphasized appear in *italics*. Informative boxed features (*Emerging IT* and *IT Ethics*), photos, and *Memory Bits* (outlines of key points) are positioned strategically to complement the running text. A *Section Self-Check* gives students an opportunity to assess their understanding at the end of each numbered section. Margin icons direct students to applicable WEB and PHitLAB CD-ROM–based lab activities. Each chapter concludes with a *Summary and Key Terms* section and *Discussion and Problem Solving* exercises.

A MIXED-MEDIA LEARNING TOOL

This textbook is one component of a *mixed-media learning tool*. Although it can be used as a stand-alone resource, its effectiveness is enhanced when used in conjunction with the Long and Long INTERNET BRIDGE or WebCT.long (companion Internet sites), PHitLABs (CD-ROM–based courseware), Image Library (multimedia lecture aid), and other media-based ancillaries. The mixed-media orientation of this edition of *Computers* gives students a power boost up the learning curve and instructors an innovative vehicle for delivery of course content. The margin icons throughout the book direct students to applicable INTERNET BRIDGE and PHitLAB activities.

We've designed the seventh edition of *Computers* mixed-media resources to give you maximum flexibility in course design and instruction. Use these resources to offer IT competency education in whatever formats meet your student and curriculum needs. We are proud that *Computers* has been and remains the standard of excellence for traditional classroom/lab instruction through seven editions. Now it has emerged as the standard for courses offered completely online via distance learning.

Throughout all aspects of this mixed-media approach to learning, we play to students' sense of exhilaration by projecting the excitement of the age of information. We have attempted to include something on every printed page, every Internet page, and every CD-ROM–based laboratory that will tickle their senses and inspire them to learn more. Eventually anxieties and fears fade away as students recognize the dawning of a new era in their life, an era bursting with opportunity.

A *COMPUTERS* EDITION FOR EVERY COURSE

Computers is organized into three modules.

- *Information Technology Concepts module*. These *eight core chapters* introduce students to the world of computing; concepts relating to interaction with computers; fundamental hardware, software, and communications concepts; going online (the Internet, online information services); and the Windows environment. This module includes three Focus on IT segments: computer history, the making of integrated circuits, and a PC buyer's guide.
- *Living in an Information Society module*. These *three chapters* are intended to give students greater insight into personal computing and our information society. Chapter 9 introduces students to a variety of PC software that can enrich their personal computing experience. The other two issue-oriented chapters discuss computing in context with society, addressing the many issues raised by the coming of the Information Age. Also, in these chapters

students travel the information superhighway, making frequent stops to discuss current and future applications. This module has one Focus on IT: Robots and Robotics.

- *Business Information Systems module.* This *two-chapter* module introduces students to the various types of information systems (MIS, DSS, expert systems, intelligent agents, and so on) and includes an overview of the latest approaches to system development.

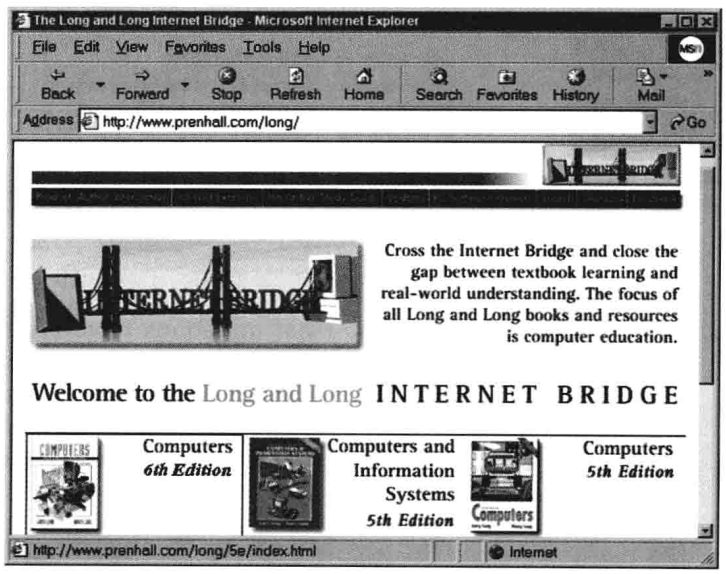
The Right PHit program offers a complete solution for introductory computer courses, from concepts to applications. Components of the Prentice Hall Applications Series can be bound with the seventh edition of *Computers* via Prentice Hall's Right PHit program. Office 97 and Office 2000 titles are available in this custom-binding program and comprise part of the most extensive array of hands-on laboratory materials offered by any textbook publisher. These hands-on manuals can be bound together with *Computers* or, if you prefer, bound separately and shrink-wrapped as a package so students can carry them to the lab one at a time. Your Prentice Hall representative will be happy to work with you to identify that combination of student support materials and packaging that best meets the needs of your lab environment.

THE *COMPUTERS* TEACHING/LEARNING SYSTEM

The seventh edition of *Computers* continues the Long and Long tradition of having the most comprehensive, innovative, and effective support package on the market. The teaching/learning system includes the following components.

Long and Long INTERNET BRIDGE

The Long and Long INTERNET BRIDGE at http://www.prenhall.com/long is designed to help students studying Long and Long resources make the transition between textbook learning and real-world understanding. To use this resource, the student connects to the Internet, navigates to the INTERNET BRIDGE, and clicks on the *Computers*, seventh edition, image. The site offers a variety of activities and services, including these main components:

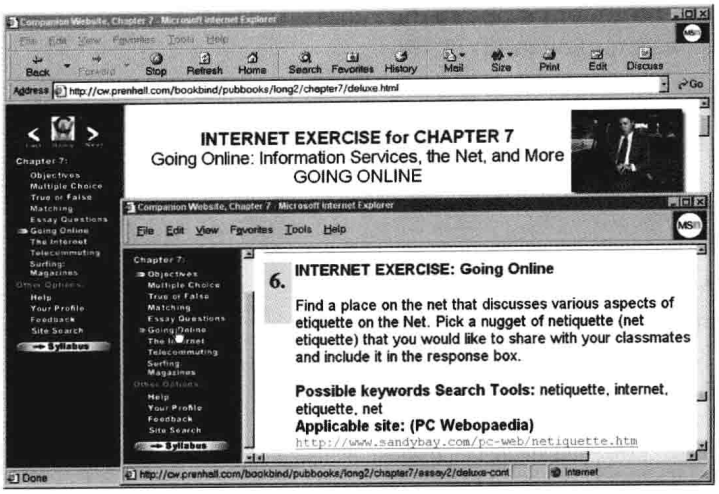


Long and Long Internet Bridge

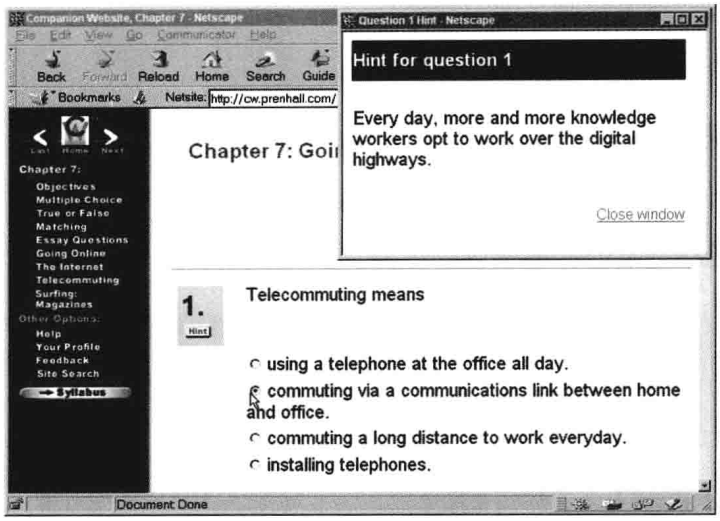
Internet Exercises

The Internet exercises encourage students to fully explore IT competency topics while familiarizing themselves with the Internet. The student selects a specific chapter to begin an online adventure that will take him or her around and into the exciting world of computing. The student's journey will include many stops that can increase his or her understanding and appreciation of the technologies that change and embellish our lives.

Each chapter has from one to seven topics (for example, Printers, Telecommuting, Multimedia, Artificial Intelligence), at least one of which is Serendipitous Surfing (for example, movies, sports, or popular culture). Each topic has from three to seven Internet exercises. For each exercise, the student: (1) reads the exercise; (2) searches for, then navigates to, the applicable Internet site(s); (3) notes the source(s) title(s) and URL(s); (4) finds the requested information; and (5) returns to the topic page and enters the requested information in the response box. When



Internet Exercises



Interactive Study Guide

all Internet exercises are completed for a given topic, the student clicks the "Submit for Grade" button to e-mail the responses to his or her instructor/grader.

Interactive Study Guide

The Internet-based Interactive Study Guide (ISG) helps the student learn and retain concepts presented in the text. After navigating to the applicable chapter, the student can view the chapter learning objectives, then choose from four skills quizzes: multiple choice, true or false, matching, or essay. These quizzes are designed to give students the opportunity to sharpen their problem-solving skills and assess their grasp of concepts.

- *Multiple Choice.* When taking the multiple-choice quiz the student simply clicks the radio button for the correct response for each question. After answering all of the questions, the student submits the answers for automatic grading. A summary report is returned to the student within seconds. The summary report includes the percentage correct, the number of incorrect answers, and the number of unanswered questions. The report also includes a question-by-question summary with an explanation, the student's response, and the correct response (if needed).
- *True or False.* The true/false interface and summary report is like that of a multiple-choice quiz.
- *Matching.* The student matches terms with applicable descriptions by selecting a response from a drop-down box.
- *Essay Questions.* The essay exam includes a text-response box for each question into which the student inserts the answer.

Most questions have hints or they provide a reference to the applicable section in the text. After completing a quiz, the student has the option of routing the answers to his or her e-mail address and/or to that of his or her instructor. The summary report is sent for multiple-choice, true/false, and matching quizzes, and the questions and answers are sent for the essay exams.

Monthly Technology Update

Each month we compile a summary of important changes and happenings in the world of computing and IT. These summaries, which are keyed to chapters, are intended to help keep the student's learning experience current with a rampaging technology.

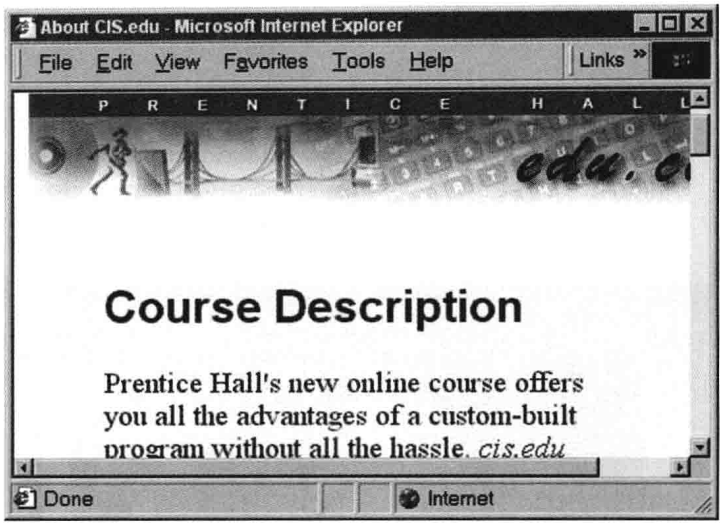
Syllabus Manager

The Syllabus Manager component of the INTERNET BRIDGE is a free utility for instructors and students who use our book/Web site products. Faculty can easily build and maintain one or more syllabi on the Web. The course syllabus is readily available to students from any PC with Internet access.

Instructor's Resource Page on the INTERNET BRIDGE

The INTERNET BRIDGE includes a frequently updated, password-protected Instructor's Resource page that is available to all instructors who adopt the Long and Long package. The Instructor's Resource Page contains a variety of downloadable resources, including supplementary images, the *IRM*, crossword puzzles, PowerPoint Slides, a buyer's guide worksheet, supplementary PC exercises, PDF format transparencies, applicable material contributed by colleagues, and other helpful teaching/learning aids.

WebCT.long: Distance Learning via the Internet

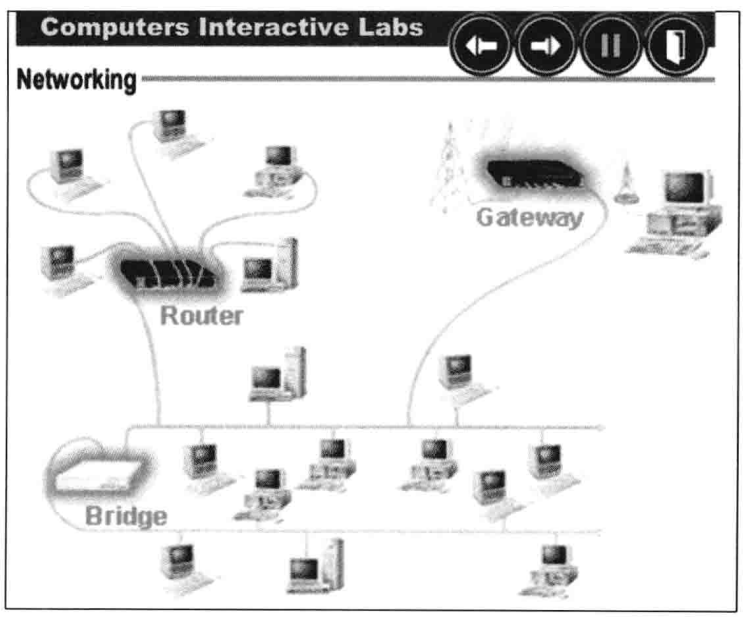


WebCT.long for Online Learning

WebCT.long at http://www.prenhall.com/WebCT.long is Prentice Hall's demonstration site supporting online IT competency courses for colleges using this book. Prentice Hall's complete galley of WebCT courses can be found at www.prenhall.com/WebCT. WebCT offers you and your colleagues all the advantages of a custom-built program, but without the hassle. If you are considering offering all or part of your course via distance learning, then WebCT.long can help you create and implement a high-quality course with relative ease. If you already offer an online course, then WebCT.long can assist you in formalizing your course. WebCT.long gives you the flexibility to integrate your custom material with the continuously updated Long and Long content. The course is packaged within the WebCT course-authoring tool so that you can customize the content to meet the most demanding curriculum requirements. Whether you are off and running or this is your first online course, WebCT.long can save you countless hours of preparation and course administration time.

This resource includes these and many other features in each of its learning modules: an introduction, objectives, summaries of key concepts, online activities that use the Internet, offline activities that integrate the texts with Web content, self-check exercises, online quizzes (auto-scored and recorded), test item database and test preparation tools (auto-scored and recorded), e-mail accounts for students and instructors, and a bulletin board primed with interesting discussion topics.

A wizard program guides you through the initial stages of course development, including the creation of a password-protected course home page. The *Course Management* feature automatically grades online tests and records scores in your electronic grade book. The *Progress Tracking* feature lets you monitor individual and overall student progress. The *Content Tracking* feature tells you how often and for how long each and every student visits a *WebCT.long* page. The WebCT shell also lets you integrate files without using HTML.



PHitLAB (Computers Interactive Labs)

Computers, Seventh Edition, Interactive CD-ROM

The interactive version is an innovative discovery-based learning tool that offers multimedia

explorations of key textbook topics, seamless integration of the World Wide Web, and more! Key features include the following:

- *Computers,* seventh edition, becomes interactive, enabling easy and intuitive navigation with Internet Explorer™ or Netscape Communicator®.
- PHitLABs offer students the opportunity to experience many of the concepts covered in the text. Each lab includes sound, video, interactive review questions, and a hands-on exercise for a complete learning experience. Sample interactive lab topics are input and output, computer architecture, disk fragmentation, binary numbers, and multimedia and virtual reality, word processing, spreadsheets, databases, networking, programming, e-mail, World Wide Web and Internet tools, Web pages and HTML, Web servers, and Y2K issues.
- PHitNotes allows students to build a personal study guide by cutting and pasting text or by adding their own materials.
- End-of-chapter Review Exercises link to the text's Companion Web site Interactive Study Guide. Students can then e-mail results to their instructor.

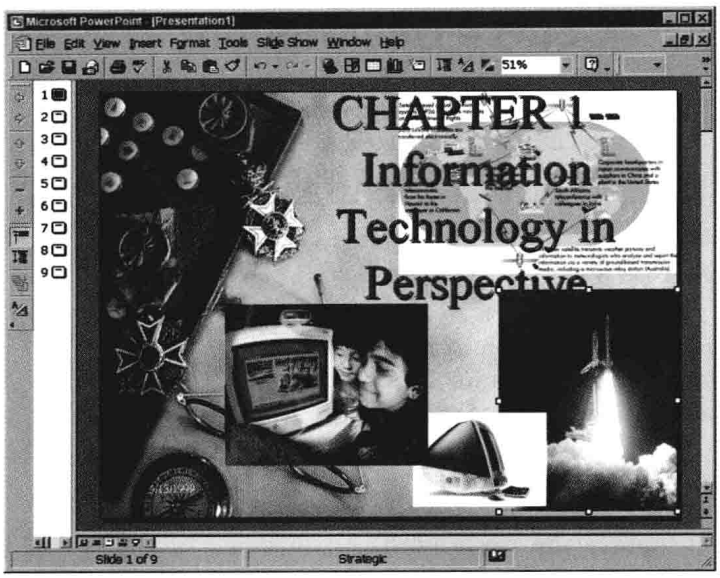


Image Library

The Instructor's One-Stop CD-ROM Resource

A variety of helpful instructor resources are distributed on a single CD-ROM, that includes an Image Library with PowerPoint slides and images from the text, Windows PH Test Manager, Test Item File, Instructor's Resource Manual, and Transparency Masters. Please see below for detailed descriptions of each. (ISBN 013-085076–4)

Image Library with PowerPoint Presentations

The *Image Library* is a wonderful resource for creating vibrant lecture presentations. The *Image Library* includes the following:

- *PowerPoint Slides.* Several hundred colorful and illustrative PowerPoint slides are available for use with Microsoft PowerPoint. The chapter-by-chapter PowerPoint slides can easily be customized to meet lecture needs.
- *Figures and Photos from the Textbook.* The *Image Library* contains just about every figure and photo in the text, all organized by chapter and section for your convenience. Caption/notes are supplied for each image within a Microsoft Word file, which can be copied or exported to a spreadsheet or database. These images and caption/notes can easily be integrated into Microsoft PowerPoint to create new presentations, or to add to existing presentations. Simply drag-and-drop slides and images in PowerPoint to sequence them for your presentation needs.
- *PDF-Format Color Transparency Masters.* Approximately one-hundred color transparency masters, which support material in the text, are provided in PDF format for protection via Acrobat Reader. Acrobat Reader lets you zoom in on those portions of the image discussed.

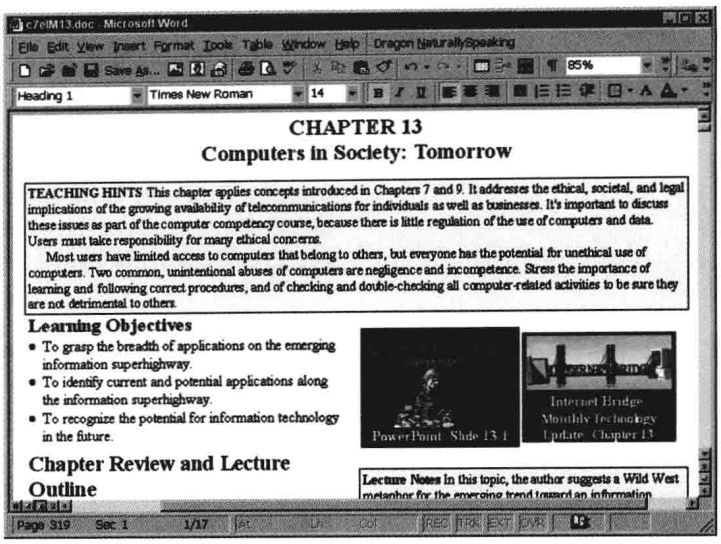
Windows PH Test Manager and Test Item File

Windows PH Test Manager is an integrated PC-compatible test-generation and classroom-management software package. The package permits instructors to design and create tests, to maintain student records, and to provide online practice

testing for students. The accompanying *Test Item File* contains thousands of multiple-choice, true/false, matching, and essay questions. The questions are organized by numbered section head. (Windows PH Test Manager ISBN 0-13-085074-8; Test Item File ISBN 013-085071-3)

Instructor's Resource Manual (IRM)

The *IRM,* which is available in hard copy, is also included in Microsoft Word format on the Instructor's One-Stop CD-ROM and on the INTERNET BRIDGE in the Instructor's Resource Section. The *IRM* contains teaching hints, references to other resources, PowerPoint and acetate images, lecture notes, key terms with definitions, solutions to review exercises, and much more. (Print *IRM*: ISBN 013-084933-2)



Instructor's Resource Manual

Color Transparency Acetates

Approximately one hundred color transparency acetates, which support material in the text, are available to adopters to facilitate in-class explanation. Transparency masters are also provided in PDF format for viewing on Acrobat Reader. (ISBN 0-13-085072-1)

Author Link

If you have questions about the text, its package, or course planning, call us (see the *IRM* for number) or e-mail us via the INTERNET BRIDGE authors' page or the Feedback page.

ACKNOWLEDGMENTS

Several hundred people have contributed to the making of this seventh edition of *Computers* and its many mixed-media ancillaries. The considerable talents of my family at Prentice Hall in editorial, production, marketing, research, and sales are evident throughout this book. We wish that every author had an Acquisitions Editor like David Alexander to bring harmony, purpose, and passion to his or her project. Also, in Editorial we are particularly grateful to Keith Kryszczun, Lori Cerreto, Lucinda Gatch, Mickey Cox, and P. J. Boardman for their continued encouragement and for helping in so many small and big ways. And to the miracle workers in Production and Manufacturing, Anne Graydon, Cheryl Asherman, Richard Bretan, Paul Smolenski, Vinnie Scelta, Michael Weinstein, and their colleagues, we say, "Way to go"—again! Nancy Evans, Kris King, Dana Simmons, Sharon Turkovich, Iain MacDonald, Matt Denham, Linda Pham, and Greg Christofferson in Marketing and Patty Arneson in Research have provided us with the insight we need to fine-tune content to meet course needs. The artistic gifts of Nancy Welcher and Grace Walkus in New Media are embedded in our Web and mixed-media supplements. And for our most beautiful and effective design—ever—we thank Cary Henrie (cover) and Amanda Kavanagh of Ark Design (interior design). In addition, we would like to thank Gretchen Miller at York Production Services for her patience and attention to detail in the production process.

We would like to thank those who created key ancillaries for *Computers:* Henry Rowe *(Instructor's Resource Manual),* C. Norman Hollingsworth of Georgia Perimeter College *(PowerPoint slides),* and Jack Pesci of Owens Community College *(Interactive Study Guide and Test Item File).*

The feedback from numerous college professors, both invited and voluntary, has proven invaluable in refining this new edition to better serve their course

needs. We would like to extend our heartfelt gratitude to these professors for their insight on this and previous editions of *Computers*.

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Finally, we wish to thank the professionals from over one hundred companies who have contributed resources (information, photos, software, and images) to this book and its supplements.

Larry Long, Ph.D. **Nancy Long, Ph.D.**