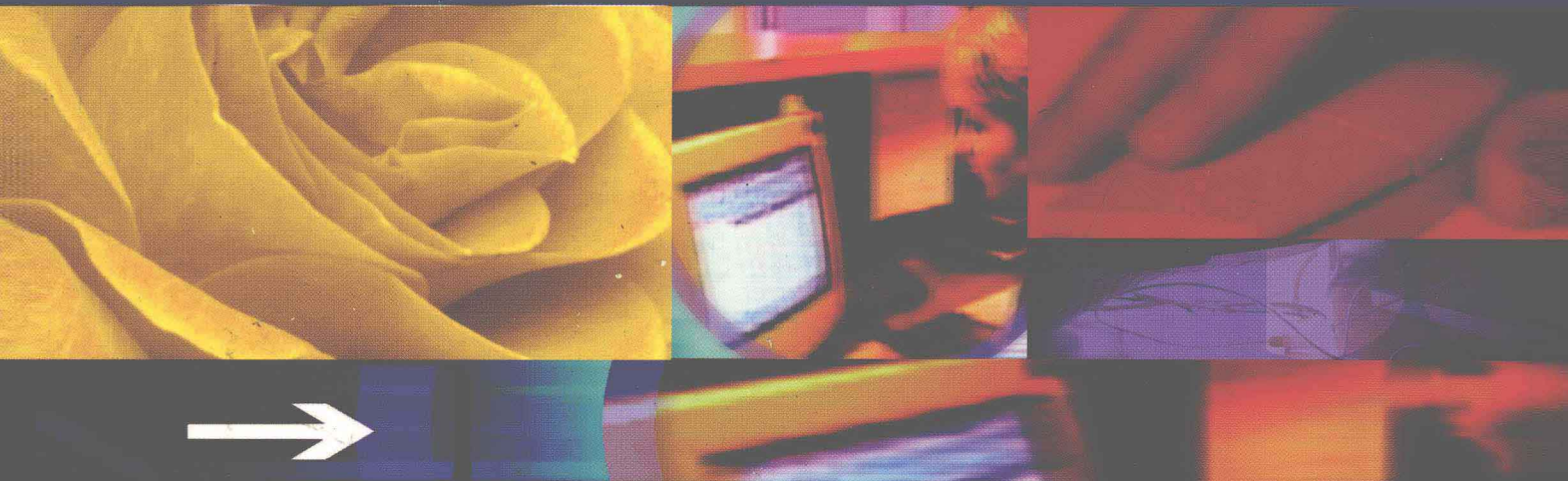


understanding computers today and tomorrow

2003 enhanced edition

CHARLES S. DEBORAH
PARKER MORLEY



enhanced

understanding computers: **today and tomorrow**

2003 enhanced edition

江苏工业学院图书馆
藏书章

CHARLES S. PARKER
DEBORAH MORLEY
BRETT MIKETTA

THOMSON
★
COURSE TECHNOLOGY

Australia • Canada • Mexico • Singapore • Spain • United Kingdom • United States



Understanding Computers: Today and Tomorrow 2003 Enhanced Edition
is published by Course Technology.

Managing Editor:
Rachel Crapser

Senior Product Manager:
Kathy Finnegan

Product Manager:
Karen Stevens

Technology Product Manager:
Amanda Young Shelton

Associate Product Manager:
Brianna Germain

Editorial Assistant:
Emilie Perreault

Marketing Manager:
Rachel Valente

Production Editor:
Jennifer Goguen, Dee Josephson,
TSI Graphics, Melissa Panagos

Development Editor:
Pam Conrad

Composition:
TSI Graphics
Gex Publishing Services

Text Designer:
Bill Brammer

Cover Designer:
Julie Malone

COPYRIGHT © 2003 Course
Technology, a division of Thomson
Learning, Inc. Thomson Learning™ is a
trademark used herein under license.

Printed in the United States of
America

1 2 3 4 5 6 7 8 9 BM 06 05 04 03

For more information, contact Course
Technology, 25 Thomson Place,
Boston, Massachusetts, 02210.

Or find us on the World Wide Web at:
www.course.com

ALL RIGHTS RESERVED. No part of this
work covered by the copyright hereon
may be reproduced or used in any
form or by any means—graphic, elec-
tronic, or mechanical, including pho-
tocopying, recording, taping, Web
distribution, or information storage
and retrieval systems—without the
written permission of the publisher.

For permission to use material from
this text or product, contact us by

Tel (800) 730-2214
Fax (800) 730-2215
www.thomsonrights.com

Disclaimer
Course Technology reserves the right
to revise this publication and make
changes from time to time in its
content without notice.

Some of the product names and com-
pany names used in this book have
been used for identification purposes
only and may be trademarks or regis-
tered trademarks of their respective
manufacturers and sellers.

Microsoft and the Office logo are
either registered trademarks or trade-
marks of Microsoft Corporation in the
United States and/or other countries.
Course Technology is an independent
entity from the Microsoft Corporation,
and not affiliated with Microsoft in
any manner.

ISBN 0-619-18712-3

understanding computers:
today and tomorrow
2003 enhanced edition

PREFACE

The best way for students to learn about technology is to use it. *Understanding Computers: Today and Tomorrow, 2003 Enhanced Edition*, provides a truly interactive approach to learning about computers with a text that is fully integrated with a completely updated, multimedia-enhanced Web site. This nontechnical, introductory text explains in straightforward terms the importance of learning about computers, types of computer systems and their components, principles by which computer systems work, practical applications of computers and related technologies, and ways in which the world is being changed by computers. The goal of this text is to provide the reader with a solid knowledge of computer basics and with a framework for using this knowledge effectively in the workplace.

KEY FEATURES

Like previous editions, *Understanding Computers: Today and Tomorrow, 2003 Enhanced Edition* is current and comprehensive. Flexible organization and an engaging presentation combine with learning tools in each chapter to help the reader master important concepts. Numerous marginal notations lead students to highly interactive multimedia tutorials, exercises, and TechTV video clips on the *Understanding Computers* Web site. Boxed features on a variety of topics provide insight on current issues of interest.

Currency

The state-of-the-art content of this book and its multimedia support package reflect the latest technologies, trends and classroom needs. Throughout the writing and production stages, enhancements were continually being made to ensure that the final product would be as current as possible.

Comprehensiveness and Depth

Accommodating a wide range of teaching preferences, *Understanding Computers: Today and Tomorrow, 2003 Enhanced Edition* provides comprehensive coverage of traditional topics while covering hot topics such as the Internet; portable PCs and mobile devices; wireless and mobile communications; Internet searching, online shopping, downloading music, and other online activities; multimedia technology and design; e-commerce and e-business; object-oriented programming; Web databases; global computing issues; and security, privacy, and other timely social issues.

Readability

We remember more about a subject if it is presented in a straightforward way and made interesting and exciting. This book is written in a conversational, down-to-earth style—one designed to be accurate without being intimidating. Concepts are explained clearly and simply, without the use of overly technical terminology. Where complex points are presented, they are made understandable with realistic examples from everyday life.

Chapter Learning Tools

1. **Outline, Learning Objectives, and Overview:** For each chapter, an Outline of the major topics to be covered, a list of student Learning Objectives, and a chapter Overview helps instructors put the subject matter of the chapter in perspective and lets students know what they will be reading about.
2. **Boldfaced Key Terms and Running Glossary:** Important terms appear in boldface type as they are introduced in the chapter. These terms are defined at the bottom of the page on which they appear and in the end-of-text glossary.
3. **Chapter Boxes:** In each chapter, a **Trend box** provides students with a look at current and upcoming developments in the world of computers; an **Inside the Industry box** provides insight into some of the personalities and practices that have made the computer industry unique and fascinating; and a **How It Works box** explains how a technology or product works in more detail than covered in the chapter. Periodic **Campus Close-Up boxes** take a look at how computers and technology are being used at colleges or other educational facilities.
4. **Illustrations and Photographs:** Instructive, current full-color illustrations and photographs appear throughout the book to help illustrate important concepts. Figures and screen shots are carefully annotated to convey important information.
5. **Summary and Key Terms:** This is a concise, section-by-section summary of the main points in the chapter. Every boldfaced key term in the chapter also appears in boldface type in the summary. A matching exercise of selected key terms helps students test their retention of the chapter material.
6. **Review Activities and Projects:** End-of-chapter activities allow students to test themselves on what they have just read. A **Self-Quiz** (with the answers at the end of the text) consists of true-false and completion questions. Five additional easily graded matching and short-answer **Exercises** are included for instructors who would like to assign graded homework. End-of-chapter **Projects** require students to extend their knowledge by doing research beyond merely reading the book. Organized into five types of projects (Short Answer/Research, Hands On, Writing About Computers, Presentation/Demonstration, and Interactive Discussion), a special icon denotes projects that are written as group projects.
7. **Web Tutors, Further Explorations, and Interactive Exercises:** Throughout the text, students are directed to the *Understanding Computers* Web site to complete multimedia-enhanced Web Tutors. The Further Exploration section of the Web site gives students easy access to a variety of Web resources containing more in-depth information on a given topic. Each chapter concludes with a multimedia-rich capstone interactive exercise. These online activities allow students to interact with the concepts discussed in the text and test their knowledge of chapter materials.
8. **Art and Photo Program:** Chapters include fully annotated illustrations integrated with the text material, as well as numerous screen shots that showcase the latest applications. Many illustrations are rendered in a photorealistic style so that you can see the details of computer components close up. In addition, current full-color photographs appear throughout to help illustrate important concepts.

Updated Windows

Three modules contain a special foldout Window containing helpful information or a photo-essay. The updated Windows included with the full text include a “The History of Computers” timeline, a “Web Guide” containing links to useful Web site resources, and a “Ubiquitous Computing” window that takes a look at the ways computers affect our lives.

End of Text Glossary

The Glossary at the end of the book defines all boldfaced key terms in the text with a page reference indicating where the term is discussed.

NEW TO THIS ENHANCED EDITION

2003 Update section

A 40-page 2003 Update section has been added after Chapter 16 and contains the following elements:

- ▼ **Chapter-by-Chapter Update Guide**—An easy-to-use two-page spread for each chapter provides students with currency updates for the content contained in the chapter, as well as an overview of related new and emerging technology trends. Illustrative color photographs and several new Chapter Boxes are included in the update.
- ▼ **Expanded Computer History Coverage**—Students also have the opportunity to learn more about computer history, specifically about the different computer generations, through a two-page Inside the Industry Computer History boxed feature.
- ▼ **Tech News Video Projects**—Eight new exciting Tech News Video Projects direct students to watch relevant Tech TV news clips available through the Online Companion Web site and prepare for a class discussion or written opinion paper.

Updated Windows

The three special foldout Windows have been updated for currency. All three foldout Windows contain new photos and updated information, and the Web link URLs on the Web Guide window have been checked and updated as needed.

STUDENT AND INSTRUCTOR SUPPORT MATERIALS

Understanding Computers: Today and Tomorrow, 2003 Enhanced Edition is available with a complete package of support materials for instructors and students. Included in the package are the comprehensive Understanding Computers Web site, an Instructor’s Resource Kit on CD-ROM, and a full-content online course.

web tutor

further
explorationtech news
video project

THE UNDERSTANDING COMPUTERS WEB SITE

The Understanding Computers Web site located at:

<http://www.course.com/parker2002>

provides media-rich support for students, including the following resources:

- ▼ **Web Tutors**—a series of multimedia-enhanced tutorials that allow students to interact with the concepts discussed in the text.
- ▼ **Further Exploration**—links to Web sites with more in-depth information on a given topic from the text.
- ▼ **Tech News Video Projects**—links to TechTV news clips.
- ▼ **Interactive Exercises**—multimedia-rich capstone exercises that allow students to test their knowledge after completing each chapter.
- ▼ **Web Guide**—provides students with categorized and regularly updated links to the Web's most useful sites.

Instructor's Resource Kit CD-ROM

All of the teaching tools available with this book are provided to the instructor on a single CD-ROM. Please note that the Instructor's Manual and ExamView Testbank are also available online at www.course.com.

Electronic Instructor's Manual

The Instructor's Manual is written to provide instructors with practical suggestions for enhancing classroom presentations. For each of the 16 chapters of the text, the Instructor's Manual provides the following components:

- ▼ A complete, three-level **Chapter Outline**.
- ▼ A list of **Learning Objectives**.
- ▼ **Summary**, oriented to the instructor, with teaching suggestions.
- ▼ A list of the **Key Terms** in the chapter and their definitions.
- ▼ **Teaching Tips**, with recommended topics for class discussion, important points to cover in class, and mention of additional instructor resources.
- ▼ A **Teaching Outline** that gives a detailed breakdown of the chapter, with all major headings and subheadings as well as points to cover under each. References to all textbook figures are also included in this outline.
- ▼ **Lecture Anecdotes** providing additional stories, news items, and information specific to chapter content to liven up lectures.
- ▼ **Answers to Exercises** that appear at the end of the chapter.
- ▼ **Suggestions for Projects** that appear at the end of the chapter.

ExamView

This textbook is accompanied by ExamView, a powerful testing software package that allows instructors to create and administer printed, computer (LAN-based), and Internet exams. ExamView includes over 2,400 questions that correspond to the topics covered in this text, enabling students to generate detailed study guides that include page references for further review. The computer-based and Internet testing components allow students to take exams at their computers, and also save the instructor time by grading each exam automatically.

PowerPoint Presentations

This book comes with Microsoft PowerPoint slides for each chapter. These are included as a teaching aid for classroom presentation, to make available to students on the network for chapter review, or to be printed for classroom distribution. Instructors can customize these presentations to cover any additional topics they introduce to the class.

Guide to Using the 2003 Update

Available online at www.course.com, a Guide to Using the 2003 Update includes suggestions for how to incorporate the material new to the 2003 Enhanced Edition into your course, a chapter-by-chapter teaching outline for the new material, and suggestions for solutions for the video projects.

Tabbing Guide

The tabbing guide can be used to show how and where this textbook has been updated for this edition from the 2000 edition. Page references are included to make planning a class easier for the instructor.

UNDERSTANDING COMPUTERS TODAY AND TOMORROW ONLINE COURSE

For instructors who want to add a richer online component to their courses, Course Technology is proud to present the *Understanding Computers: Today and Tomorrow* Online Course in WebCT and BlackBoard. This new, full-content online course correlates with the text and can be used in a variety of ways: to supplement the text in a traditional classroom setting or as a virtual classroom for distance learning students. Students learn technology by interacting with the content in this dynamic, interactive multimedia environment. Each chapter of the course is filled with interactive activities such as the Web Tutors and Interactive Exercises, links, animations, demonstrations, collaborative classroom activities, critical thinking exercises, and self-tests. For more information on how to bring online content to your course, contact your local Course Technology sales representative.

ACKNOWLEDGMENTS

The following past and present reviewers of this text deserve a special word of thanks for their thoughtful suggestions that have helped to define and improve the quality of this text over the years.

2003 Enhanced Edition – Educational Reviewers

Beverly Amer, Northern Arizona University
 Cesar Marron, University of Wyoming
 David Womack, University of Texas, San Antonio

2003 Enhanced Edition – Industry Expert Reviewers

Jeremy Bates, Multimedia Developer, R & L Multimedia Developers
 Charles Hayes, Product Marketing Manager, SimpleTech, Inc.
 Rick McGowan, Vice President & Senior Software Engineer, Unicode, Inc.
 Russell Reynolds, Chief Operating Officer & Web Designer, R & L Multimedia Developers
 Dave Stow, Database Specialist, OSE Systems Inc.

2002 Edition – Educational Reviewers

Beverly Amer, Northern Arizona University
 Chris Brown, Bemidji State University
 Joann C. Cook, College of DuPage
 Terry Felke, WR Harper College
 Janos T. Fustos, Metropolitan State
 Jim Hanson, Austin Community College
 Richard Kiger, Dallas Baptist University
 James Lasalle, University of Arizona
 Paul Lou, Diablo Valley College
 Kent Lundin, Brigham Young University-Idaho
 Donna Madsen, Kirkwood Community College
 Randy Marak, Hillsboro CC
 Joseph D. Oldham, University of Kentucky
 Lisa B. Perez, San Joaquin Delta College
 Delores Pusins, Hillsborough CC
 Mike Rabaut, Hillsborough CC
 Tim Sylvester, Glendale Community College
 Semih Tahaoglu, Southeastern Louisiana University
 Merrill Wells, Red Rocks Community College
 George Woodbury, College of the Sequoias
 Nan Woodsome, Araphoe Community College
 Israel Yost, University of New Hampshire
 Vic Zamora, Mt. San Antonio College

2002 Edition – Industry Expert Reviewers

New to this edition are individuals working in the computer industry who reviewed parts of the textbook in their area of expertise, to insure the timeliness and technical accuracy of the information contained in the text. Special thanks to the following individuals:

Alan Charlesworth, Staff Engineer, Sun Microsystems
 Khaled A Elamrawi, Senior Marketing Engineer, Intel Corporation
 Timothy D. O'Brien, Senior Systems Engineer, Fujitsu Software
 John Paulson, Manager, Product Communications, Seagate Technology
 Omid Rahmat, Editor in Chief, Tom's Hardware Guide www.tomshardware.com

Previous Editions

Beverly Amer, Northern Arizona University; James Ambroise Jr., Southern University, Louisiana; Virginia Anderson, University of North Dakota; Robert Andree, Indiana University Northwest; Linda Armbruster, Rancho Santiago College; Michael Atherton, Mankato State University; Gary E. Baker, Marshalltown Community College; Richard Batt, Saint Louis Community College at Meremec; Luverne Bierle, Iowa Central Community College; Jerry Booher, Scottsdale Community College; Frederick W. Bounds, Georgia Perimeter College; James Bradley, University of Calgary; Curtis Bring, Moorhead State University; Brenda K. Britt, Fayetteville Technical Community College; Cathy Brotherton, Riverside Community College; Janice Burke, South Suburban College; James Buxton, Tidewater Community College, Virginia; Gena Casas, Florida Community College, Jacksonville; Thomas Case, Georgia Southern University; John E. Castek, University of Wisconsin-La Crosse; Mario E. Cecchetti, Westmoreland County Community College; Jack W. Chandler, San Joaquin Delta College; Jerry M. Chin, Southwest Missouri State University; Edward W. Christensen, Monmouth University; Carl Clavadetscher, California State Polytechnic University; Vernon Clodfelter, Rowan Technical College, North Carolina; Laura Cooper, College of the Mainland, Texas; Cynthia Corritore, University of Nebraska at Omaha; Sandra Cunningham, Ranger College; Marvin Daugherty, Indiana Vocational Technical College; Donald L. Davis, University of Mississippi; Robert H. Dependahl Jr., Santa Barbara College, California; Donald Dershem, Mountain View College; John DiElsi, Marcy College, New York; Mark Dishaw, Boston University; Eugene T. Dolan, University of the District of Columbia; Bennie Allen Dooley, Pasadena City College; Robert H. Dependahl Jr.; Santa Barbara City College; William Dorin, Indiana University Northwest; Jackie O. Duncan, Hopkinsville Community College; John W. Durham, Fort Hays State University; Hyun B. Eom, Middle Tennessee State University; Michael Feiler, Merritt College; J. Patrick Fenton, West Valley Community College; James H. Finger, University of South Carolina at Columbia; William C. Fink, Lewis and Clark Community College, Illinois; Ronald W. Fordonski, College of Du Page; Connie Morris Fox, West Virginia Institute of Technology; Paula S. Funkhouser, Truckee Meadows Community College; Gene Garza, University of Montevallo; Timothy Gottleber, North Lake College; Dwight Graham, Prairie State College; Wade Graves, Grayson County College; Kay H. Gray, Jacksonville State University; David W. Green, Nashville State Technical Institute, Tennessee; George P. Grill, University of North Carolina, Greensboro; John Groh, San Joaquin Delta College; Rosemary C. Gross, Creighton University; Dennis Guster, Saint Louis Community College at Meremec; Joe Hagarty, Raritan Valley Community College; Donald Hall, Manatee Community College; Sallyann Z. Hanson, Mercer County Community College; L. D. Harber, Volunteer State Community College, Tennessee; Hank Hartman, Iowa State University; Richard Hatch, San Diego State University; Mary Lou Hawkins, Del Mar College; Ricci L. Heishman, Northern Virginia Community College; William Hightower, Elon College, North Carolina; Sharon A. Hill, Prince George's Community College, Maryland; Fred C. Homeyer, Angelo State University; Stanley P. Honacki, Moraine Valley Community College; L. Wayne Horn, Pensacola Junior College; J. William Howorth, Seneca College, Ontario, Canada; Mark W. Huber, East Carolina University; Peter L. Irwin, Richland College, Texas; Nicholas JohnRobak, Saint Joseph's University; Elizabeth Swoope Johnson, Louisiana State University; Jim Johnson, Valencia Community College; Mary T. Johnson, Mt. San Antonio College; Susan M. Jones, Southwest State University; Amardeep K. Kahlon, Austin Community College; Robert T. Keim, Arizona State University; Mary Louise Kelly, Palm Beach Community College; William R. Kenney, San Diego Mesa College; Richard Kerns, East Carolina University, North Carolina; Glenn Kersnick, Sinclair Community College, Ohio; Gordon C. Kimbell, Everett Community College, Washington; Mary Veronica Kolesar, Utah State University; Robert Kirklin, Los Angeles Harbor Community

College; Judith A. Knapp, Indiana University Northwest; James G. Kriz, Cuyahoga Community College, Ohio; Joan Krone, Denison University; Fran Kubicek, Kalamazoo Valley Community College; Rose M. Laird, Northern Virginia Community College; Robert Landrum, Jones Junior College; Shelly Langman, Bellevue Community College; James F. LaSalle, The University of Arizona; Linda J. Lindaman, Black Hawk College; Chang-Yang Lin, Eastern Kentucky University; Alden Lorents, Northern Arizona University; Paul M. Lou, Diablo Valley College; Deborah R. Ludford, Glendale Community College; Barbara J. Maccarone, North Shore Community College; Donna Madsen, Kirkwood Community College; Wayne Madison, Clemson University, South Carolina; Donna L. Madsen, Kirkwood Community College; Kathryn A. Marold, Ph.D., Metropolitan State College of Denver; Randy Marak, Hill College; Gary Marks, Austin Community College, Texas; Ed Martin, Kingsborough Community College; Vickie McCullough, Palomar College; James W. McGuffee, Austin Community College; James McMahon, Community College of Rhode Island; William A. McMillan, Madonna University; Don B. Medley, California State Polytechnic University; John Melrose, University of Wisconsin—Eau Claire; Mary Meredith, University of Southwestern Louisiana; Marilyn Meyer, Fresno City College; Carolyn H. Monroe, Baylor University; William J. Moon, Palm Beach Community College; Marilyn Moore, Purdue University; Marty Murray, Portland Community College; Don Nielsen, Golden West College; George Novotny, Ferris State University; Richard Okezie, Mesa Community College; Dennis J. Olsen, Pikes Peak Community College; Bob Palank, Florissant Community College; James Payne, Kellogg Community College; Robert Ralph, Fayetteville Technical Institute, North Carolina; Herbert F. Rebhun, University of Houston-Downtown; Arthur E. Rowland, Shasta College; Kenneth R. Ruhup, St. Petersburg Junior College; John F. Sanford, Philadelphia College of Textiles and Science; Carol A. Schwab, Webster University; Larry Schwartzman, Trident Technical College; Benito R. Serenil, South Seattle Community College; Tom Seymour, Minot State University; John J. Shuler, San Antonio College, Texas; Gayla Jo Slauson, Mesa State College; Harold Smith, Brigham Young University; Willard A. Smith, Tennessee State University; Timothy M. Stanford, City University; Alfred C. St. Onge, Springfield Technical Community College, Massachusetts; Michael L. Stratford, Charles County Community College, Maryland; Karen Studniarz, Kishwaukee College; Sandra Swanson, Lewis & Clark Community College; William H. Trueheart, New Hampshire College; Jane J. Thompson, Solano Community College; Sue Traynor, Clarion University of Pennsylvania; James D. Van Tassel, Mission College; James R. Walters, Pikes Peak Community College; Joyce V. Walton, Seneca College, Ontario, Canada; Diane B. Walz, University of Texas at San Antonio; Joseph Waters, Santa Rosa Junior College, California; Liang Chee Wee, University of Arizona; Fred J. Wilke, Saint Louis Community College; Charles M. Williams, Georgia State University; Roseanne Witkowski, Orange County Community College; James D. Woolever, Cerritos College; Patricia Joann Wykoff, Western Michigan University; A. James Wynne, Virginia Commonwealth University; and Robert D. Yearout, University of North Carolina at Asheville.

We would also like to thank the people on the Course team—their professionalism, attention to detail, and enormous enthusiasm makes working with them a pleasure. In particular, Rachel Crapser, Amanda Young Shelton, and Pam Conrad were instrumental in developing the format for this update, and Pam, Amanda, and Jennifer Goguen were invaluable during the writing, rewriting, and production of this book. Thanks also to Rachel Lucas for her video research; Anne Leuthold at TechTV for helping us secure the Tech TV video clips; Brianna Germain for managing the Instructor's Resources package and Online Companion; Emilie Perreault for all of the work that she has done; and Rachel Valente for her efforts on marketing this text. Thanks also to Kristen Duerr, Greg Donald, Melissa Panagos, Donna Gridley, and Kathy Finnegan.

We are also very appreciative of Elizabeth Boyd for her excellent work on the Test Bank and her helpful suggestions for text updates, as well as the numerous organizations that were kind enough to supply information and photographs for this text. Special thanks goes to Elizabeth Hayes for her hard work on behalf of this book for the past several editions, as well as her great job creating the PowerPoint slides that accompany this text.

Charles S. Parker

Deborah Morley

We sincerely hope you find this book interesting, informative, and enjoyable to read. If you have any suggestions for improvement, comments, or corrections that you'd like to be considered for future editions, please send them to deborah.morley@course.com

BRIEF CONTENTS

Preface

MODULE Introduction 1

Chapter 1

Introduction to the World of Computers 3

Chapter 2

Using Your PC, Windows, and the Web 37

MODULE Hardware 81

Chapter 3

The System Unit: Processing and Memory 83

Chapter 4

Storage 129

Chapter 5

Input and Output 167

MODULE Software 209

Chapter 6

Systems Software 211

Chapter 7

Application Software 251

MODULE Networks 295

Chapter 8

Communications and Networks 298

Chapter 9

The Internet and World Wide Web 345

MODULE Internet Applications 393

Chapter 10

Multimedia and the Web 395

Chapter 11

E-Business and E-Commerce 437

MODULE Systems 475

Chapter 12

Information Systems and Systems
Development 477

Chapter 13

Program Development and Programming
Languages 517

Chapter 14

Databases and Database Management
Systems 565

MODULE Computers In Our Lives 603

Chapter 15

Ethics, Computer Crime, Privacy, and Other
Social Issues 605

Chapter 16

You and Your PC 643

2003 Update U-1

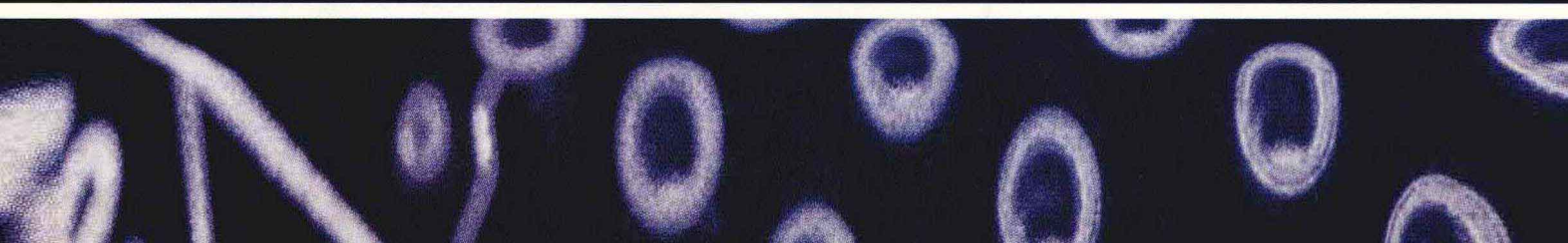
Appendix A-1

Quiz Answers Q-1

Credits C-1

Glossary G-1

Index I-1



CONTENTS

Preface v

MODULE Introduction 1

Chapter 1 Introduction to the World of Computers 3

Overview 4

Computers in Your Life 4

> Why Learn About Computers? 4

> Computers in the Home 5

trend: Ready-to-Wear PCs 7

Computers in Our Society 7

What Is a Computer and What Does It Do? 8

> Traditional and Multimedia Hardware 9

> Software 10

> Data, Information, and Programs 11

> Users and Computer Professionals 14

inside the industry: Programs That Run Amok 15

Computer Networks and the Internet 16

> The Internet 16

> Accessing Networks 16

> Network Servers 17

Computer Systems to Fit Every Need 18

> Mobile Devices 18

how it works: Voice-Activated Internet 19

> Personal Computers 20

campus close-up: Wired Med Students 22

> Midrange Computers 23

> Mainframe Computers 24

> Supercomputers 25

Computers and Society 25

> The Information Age and the New Information Revolution 26

> Benefits of a Computer-Oriented Society 26

> Impact of Computers, the Internet, and a Networked Economy 26

Summary 28

Key Terms 30

Review Activities 31

Projects 33

Chapter 2 Using Your PC, Windows, and the Web 37

Overview 38

Starting Your Computer: The Boot Process 38

Using the Windows Operating System 39

> The Windows Interface 40

> Opening Windows and Starting Programs 46

> Manipulating Windows 47

> Shutting Down the Computer 50

Using the Internet and World Wide Web 50

> What Is the World Wide Web? 50

> What Is a Browser? 51

how it works: Internet Appliances 53

> Accessing the Internet 51

> Internet Addresses 52

> Surfing the Web 55

> Using Bookmarks and the History List 59

> Searching the Web 59

E-Mail 63

trend: Shopping Bots and other Types of Intelligent Agents 64

> Sending E-Mail 65

> Receiving E-Mail 67

> Managing E-Mail 67

> Mailing Lists, Newsgroups, Chat, and Instant Messaging 67

inside the industry: Emoticons: Expressing Yourself with Your PC 68

> Netiquette 68

Downloading and Installing Plug-Ins and Other Files 69

> Downloading Files 70

> Using Downloaded Files 70

Summary 72

Key Terms 74

Review Activities 75

Projects 76

The History of Computers Window

MODULE Hardware 81

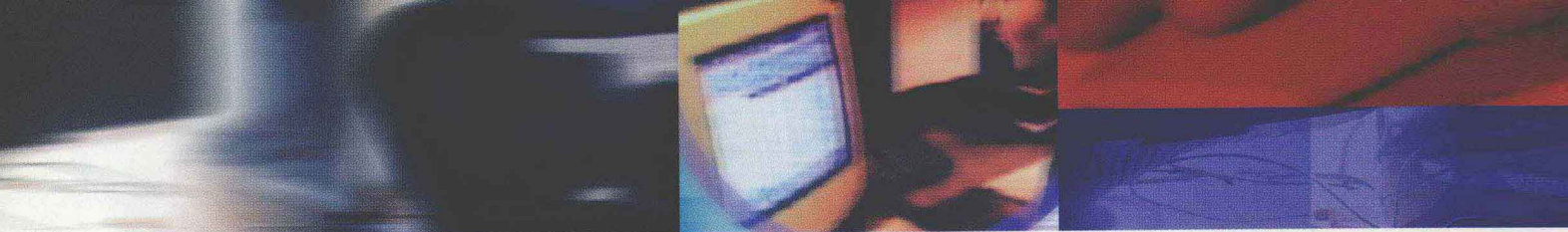
Chapter 3 The System Unit: Processing and Memory 83

Overview 84

Data and Program Representation 84

> Digital Data Representation 84

> The Binary Numbering System 86



- > Coding Systems for Text-Based Data 87
- > Coding Systems for Other Types of Data 89
- how it works:** MP3 Compression 92
- > Machine Language 92

Inside the System Unit 93

- > CPU 93
- trend:** Smart Bullets, Smart Tennis Shoes, High-Tech Pets, and Other Unusual Uses for Microchips 96

inside the industry: Moore's Law 97

- > Memory 98
- > Buses 101
- > System Expansion 103
- > Ports 105

How the CPU Works 108

- > Typical CPU Components 108
- > The System Clock and the Machine Cycle 110

Making Computers Faster Now and in the Future 113

- > Speeding Up Your System Today 113
- > Strategies for Making Computers Speedier 114
- > Future Trends 118

Summary 120

Key Terms 122

Review Activities 123

Projects 125

Chapter 4 Storage 129

Overview 130

Properties of Storage Systems 130

- > Physical Parts 130
- > Nonvolatility Property 131
- > Removable vs. Fixed Media 131
- > Random vs. Sequential Access 132
- > Logical vs. Physical Representation 132

Magnetic Disk Systems 133

- > Floppy Disks 134
- > Hard Disks 138

Optical Discs 146

- > CDs 146
- > DVDs 148
- > Magneto-Optical Discs 148

inside the industry: Holographic Storage 149

Other Types of Storage Systems 149

- > Magnetic Tape Systems 149

- > Online Storage 150

- > Smart Cards 150

how it works: Smart Cards 152

- > Flash Memory Devices 153

Comparing Storage Alternatives 153

trend: How Many Tomorrows Will Today's Data Last? 156

Summary 157

Key Terms 159

Review Activities 160

Projects 162

Chapter 5 Input and Output 167

Overview 168

Input and Output 168

Keyboards 169

Pointing Devices 170

- > Mouse 170
- > Electronic Pens 171
- > Touch Screens 174
- > Other Pointing Devices 175

Scanners and Related Devices 176

- > Optical Scanners 177
- > Optical Readers 179

trend: No More Hanging Chads? 180

- > Magnetic Ink Character Recognition Reader 182

Multimedia Input Devices 183

- > Digital Cameras 183
- > Video Cameras 184
- > Audio Input Devices 185

how it works: Voice Recognition 186

Display Devices 187

- > Size 187
- > Resolution 188
- > Graphics Standards 188
- > Color vs. Monochrome Displays 189
- > CRT vs. Flat-Panel Displays 189
- > HDTV 190

Printers 192

- > Characteristics of Printers 192
- > Personal Printers 193
- > Network Printers 196
- > Special-Purpose Printers 197

Multimedia Output Devices 198

- > Speakers 198

inside the industry: Point, Click, and ...

Smell? 199

> Data and Multimedia Projectors 200

> Voice-Output Systems 200

Multifunction Devices 200

Summary 201

Key Terms 203

Review Activities 204

Projects 206

MODULE Software 209

Chapter 6 Systems Software 211

Overview 212

Systems Software vs. Application Software 212

The Operating System 213

> Differences among Operating Systems 214

> Functions of an Operating System 216

> Processing Techniques for Increased Efficiency 220

Common Operating Systems for Desktop PCs and Servers 224

> DOS 224

> Windows 225

inside the industry: Project Code Names 228

> Mac OS 228

> Unix 229

> Linux 230

> NetWare 231

> OS/2 and OS/2 Warp 232

Other Operating Systems 232

> Alternative PC Operating Systems 232

> Operating Systems for Mobile Devices 232

> Operating Systems for Internet Appliances 234

> Operating Systems for Larger Computers 234

Myths About Operating Systems 234

> Myth 1: One Computer Can Have Only One Operating System Installed 234

> Myth 2: It Is Difficult to Change or Upgrade Operating Systems 234

trend: Smart Cars 235

> Myth 3: If You Don't Use Windows, You Can't Find Software 236

Utility Programs 236

> Diagnostic Programs 237

> Backup Utilities 238

> Uninstall Utilities 238

> Disk Defragmentation Programs 238

> File Compression Programs 239

The Future of Operating Systems 240

how it works: Text Compression 241

Summary 242

Key Terms 244

Review Activities 245

Projects 247

Chapter 7 Application Software 251

Overview 252

The Basics of Application Software 252

> Document-Handling Operations 252

> Software Suites 253

inside the industry: Lake Bill 254

> Online Help 255

> Ownership and Distribution Rights 257

Word Processing Concepts 259

> What Is Word Processing Software? 259

trend: Open Source Software 260

> Creating and Editing Documents 261

> Formatting Documents 263

> Graphics, Tables, and Templates 265

> Word Processing and the Web 265

Spreadsheet Concepts 266

> What Is a Spreadsheet Program? 266

> Creating and Editing a Worksheet 267

> Formatting a Worksheet 269

> Charts and Sensitivity Analysis 271

> Spreadsheets and the Web 272

Database Concepts 272

> What Is a Database Program? 272

> Creating a Database 273

> Modifying a Database 274

> Queries and Reports 275

> Databases and the Web 277

Presentation Graphics Concepts 277

> What Is Presentation Graphics Software? 277

> Creating a Presentation 278

> Enhancing a Presentation 280

> Presentation Graphics and the Web 280

Other Types of Application Software 280

> Desktop and Personal Publishing 281

> Multimedia Software 281

> Personal Information Managers 283

> Project Management Software 283

> Accounting and Personal Finance Software 283