Contents at a Glance

Chapter 1
The Impact of Technology in a Changing World ................................................................. 2

Chapter 2
Looking at Computers: Understanding the Parts .............................................................. 36

Chapter 3
Using the Internet: Making the Most of the Web’s Resources ....................................... 80

Chapter 4
Application Software: Programs That Let You Work and Play ...................................... 120

Chapter 5
System Software: The Operating System, Utility Programs, and File Management .......... 158

Chapter 6
Understanding and Assessing Hardware: Evaluating Your System ............................. 198

Chapter 7
Networking: Connecting Computing Devices ................................................................. 240

Chapter 8
Managing Your Digital Lifestyle: Challenges and Ethics .............................................. 272

Chapter 9
Securing Your System: Protecting Your Digital Data and Devices ............................. 322

Chapter 10
Behind the Scenes: Software Programming ................................................................. 368

Chapter 11
Behind the Scenes: Databases and Information Systems .............................................. 412

Chapter 12
Behind the Scenes: Networking and Security in the Business World ......................... 456

Chapter 13
Behind the Scenes: How the Internet Works ................................................................. 498

Appendix A
The History of the Personal Computer ................................................................. A-1

Appendix B
Careers in IT ................................................................................................................. B-1
Glossary ......................................................................................................................... G-1
Index ............................................................................................................................ I-1
# Contents

## Chapter 1

The Impact of Technology in a Changing World ................................................. 2

### Part 1: Technology in Society ........................................................................ 4

**Learning Outcome 1.1** You will be able to discuss the impact of the tools of modern technology on national and global issues.

- **Technology in a Global Society** ..................................................................... 4
  - Impact of Tools of Modern Technology .............................................................. 4
  - **Objective 1.1** Describe various technological tools being used to impact national and global issues.
  - Global Issues ....................................................................................................... 5
  - **Objective 1.2** Describe various global social issues that are being affected by technology.

- **Technology Connects Us with Others** .......................................................... 6
  - Technology Impacts How and Why We Connect and Collaborate ..................... 6
  - **Objective 1.3** Describe how technology is changing how and why we connect and collaborate with others.
  - Technology Impacts How We Consume ............................................................. 7
  - **Objective 1.4** Summarize how technology has impacted the way we choose and consume products and services.

### Part 2: Emerging Technologies and Ethical Computing .................................. 13

**Learning Outcome 1.2** You will be able to describe emerging technologies, such as artificial intelligence, and how technology creates new ethical debates.

- **Artificial Intelligence** .................................................................................... 13
  - Artificial Intelligence Basics ............................................................................. 13
  - **Objective 1.6** Describe artificial intelligence systems and explain their main goals.
  - **HELPDESK:** Technology Impacts ................................................................. 13

- **ETHICS IN IT:** Ethics in Computing ............................................................... 16

- **Working with Artificial Intelligence and Other Information Technologies** .......... 17
  - Technology and Your Career ............................................................................ 17
  - **Objective 1.7** Describe how artificial intelligence and other emerging technologies are important in many careers.
  - **BITS&BYTES:** Is It AI or Human? Take a Turing Test! ................................. 19
  - **DIG DEEPER:** Augmented and Virtual Realities ............................................ 21

- **Ethical Computing** ....................................................................................... 22
  - Defining Ethics .................................................................................................. 22
  - **Objective 1.8** Define ethics and examine various ethical systems.
  - **SOUND BYTE:** How to Debate Ethical Issues ............................................. 22
  - Personal Ethics .................................................................................................. 23
  - **Objective 1.9** Describe influences on the development of your personal ethics.
  - Ethics and Technology ..................................................................................... 25
  - **Objective 1.10** Present examples of how technology creates ethical challenges.
  - **SOLVE THIS:** How Technology Is Used on the World Stage and in Your Personal Life ................................. 35

iv  Contents
Chapter 2

Looking at Computers: Understanding the Parts ................................................................. 36

Part 1: Understanding Digital Components ........................................................................ 38

Learning Outcome 2.1 You will be able to describe the devices that make up a computer system.

Understanding Your Computer .......................................................................................... 38

Objective 2.1 Describe the four main functions of a computer system and how they interact with data and information.

Binary: The Language of Computers .................................................................................. 39

Objective 2.2 Define bits and bytes, and describe how they are measured, used, and processed.

SOUND BYTE: Binary Numbers Interactive ........................................................................ 39

Types of Computers .......................................................................................................... 41

Objective 2.3 List common types of computers, and discuss their main features.

ACTIVE HELPDESK: Understanding Bits and Bytes ......................................................... 41

BITS&BYTES: Today’s Supercomputers: Faster Than Ever ................................................ 45

Input Devices ..................................................................................................................... 45

Physical Keyboards and Touch Screens ........................................................................... 45

Objective 2.4 Identify the main types of keyboards and touch screens.

Mice and Other Pointing Devices ...................................................................................... 47

Objective 2.5 Describe the main types of mice and pointing devices.

DIG DEEPER: How Touch Screens Work ......................................................................... 48

BITS&BYTES: Distributed Computing: Putting Your Computer to Work While You Sleep ........................................................................................................ 49

Image, Sound, and Sensor Input ....................................................................................... 49

Objective 2.6 Explain how images, sounds, and sensor data are input into computing devices.

Output Devices .................................................................................................................. 51

Image and Audio Output .................................................................................................. 51

Objective 2.7 Describe options for outputting images and audio from computing devices.

BITS&BYTES: Near Field Communication (NFC): Pay (or Get Paid) Anywhere with Your Phone ........................................................................................................ 53

Printers .............................................................................................................................. 53

Objective 2.8 Describe various types of printers, and explain when you would use them.

BITS&BYTES: Medical Devices and 3D Printing ............................................................... 56

TRY THIS: What’s Inside My Computer? .......................................................................... 58

MAKE THIS: TOOL: App Inventor 2 or Thunkable .......................................................... 59

Part 2: Processing, Storage, and Connectivity .................................................................... 60

Learning Outcome 2.2 You will be able to describe how computers process and store data and how devices connect to a computer system.

Processing and Memory on the Motherboard .................................................................. 60

The Motherboard and Memory ......................................................................................... 60

Objective 2.9 Describe the functions of the motherboard and RAM.

SOUND BYTE: Smartphones Are Really Smart ................................................................ 61

Processing .......................................................................................................................... 61

Objective 2.10 Explain the main functions of the CPU.

Storing Data and Information .......................................................................................... 62

Storage Options on Computing Devices ........................................................................... 62

Objective 2.11 Describe the various means of storing data and information with computing devices.

ETHICS IN IT: What Is Ethical Computing? ...................................................................... 64

TRENDS IN IT: Green Computing (Green IT) ................................................................. 65

Connecting Peripherals to the Computer ......................................................................... 66

Computer Ports .................................................................................................................. 66

Objective 2.12 Describe common types of ports used today.

HELPDESK: Exploring Storage Devices and Ports .......................................................... 66

Contents
Chapter 3

Using the Internet: Making the Most of the Web's Resources

Learning Outcome 3.1 You will be able to explain how the Internet works and how it is used for collaboration, communication, commerce, and entertainment purposes.

Objective 3.1 Describe how the Internet got its start.

Objective 3.2 Explain how data travels on the Internet.

Collaborating and Communicating on the Web

Objective 3.3 Evaluate the tools and technologies used to collaborate on the web.

Objective 3.4 Summarize the technologies used to communicate over the web.

Conducting Business on the Web

Objective 3.5 Describe how business is conducted using the Internet.

Objective 3.6 Summarize precautions you should take when doing business online.

DIG DEEPER: How Cloud Computing Works

Objective 2.14 Describe how cloud computing works.

Objective 2.13 Describe how to manage power consumption on computing devices.

Objective 2.14 Define ergonomics, and discuss the ideal physical setup for using computing devices.

BIT&SBYTES: Sleep Better and Avoid Eyestrain: Use Less Blue Light

SOLVE THIS: Technology Wish List

Part 2: Using the Web Effectively

Learning Outcome 3.2 You will be able to describe the tools and techniques required to navigate and search the web.

Accessing and Moving Around the Web

Objective 3.7 Explain what web browsers are, and describe their common features.

Objective 3.8 Explain what a URL is and discuss its main parts.

Objective 3.9 Describe tools used to navigate the web.

Searching the Web Effectively

Objective 3.10 Describe the types of tools used to search the web, and summarize strategies used to refine search results.

Objective 3.11 Compare and evaluate search engines.

Objective 3.12 Evaluate search results.

Objective 3.13 Summarize precautions you should take when searching the web.

Objective 3.14 Summarize precautions you should take when using online resources.

Power Management and Ergonomics

Objective 2.14 Define ergonomics, and discuss the ideal physical setup for using computing devices.

Objective 2.13 Describe how to manage power consumption on computing devices.

Setting It All Up: Ergonomics

Setting It All Up: Power Controls and Power Management

Setting It All Up: Use Less Blue Light

SOLVE THIS: Technology Wish List

Contents
# Chapter 4

**Application Software: Programs That Let You Work and Play**.......120

## Part 1: Accessing, Using, and Managing Software.................................122

### Learning Outcome 4.1
You will be able to explain the ways to access and use software and describe how to best manage your software.

**Software Basics** ..................................................................................122
- Application vs. System Software..........................................................122
- **Objective 4.1** Compare application software and system software.
- Distributing Software..............................................................................122
- **Objective 4.2** Explain the differences between commercial software and open source software and describe models for software distribution.

**BITS&BYTES:** Finding Alternative Software ........................................123

**Managing Your Software** ....................................................................123
- Purchasing Software................................................................................123
- **Objective 4.3** Explain the different options for purchasing software.
- **TRENDS IN IT:** Mobile Payment Apps: The Power of M-Commerce ....124
- **HELPDESK:** Buying and Installing Software......................................125
- Installing and Uninstalling Software......................................................125
- **Objective 4.4** Describe how to install and uninstall software.
- **BITS&BYTES:** Ridding Your Computer of “Bloat” .........................125
- Upgrading Software................................................................................126
- **Objective 4.5** Explain the considerations around the decision to upgrade your software.
- **DIG DEEPER:** How Number Systems Work ....................................126
- Software Licenses..................................................................................127
- **Objective 4.6** Explain how software licenses function.
- **SOUND BYTE:** Where Does Binary Show Up?..................................127
- **ETHICS IN IT:** Can I Borrow Software That I Don’t Own? ................129
- **TRY THIS:** Citing Website Sources....................................................131
- **MAKE THIS:** TOOL: App Inventor 2 or Thunkable ..............................132

## Part 2: Application Software..................................................................133

### Learning Outcome 4.2
Describe the different types of application software used for productivity and multimedia.

**Productivity and Business Software** ...................................................133
- Productivity Software...........................................................................133
- **Objective 4.7** Categorize the types of application software used to enhance productivity and describe their uses and features.
Chapter 5

System Software: The Operating System, Utility Programs, and File Management ................................................................. 158

**Part 1: Understanding System Software** ......................................................................................................................... 160

**Learning Outcome 5.1** You will be able to explain the types and functions of operating systems and explain the steps in the boot process.

- Operating System Fundamentals ............................................................................................................................................. 160
  - Operating System Basics ...................................................................................................................................................... 160
  - **Objective 5.1** Discuss the functions of the operating system.
  - Operating Systems for Personal Use .................................................................................................................................. 160
  - **Objective 5.2** Explain the most popular operating systems for personal use.
  - **BITS&BYTES:** Open Source Operating Systems .......................................................................................................... 162
  - **BITS&BYTES:** Operating Systems for the Smart Home .................................................................................................. 162
  - Operating Systems for Machinery, Networks, and Business .......................................................................................... 163
  - **Objective 5.3** Explain the different kinds of operating systems for machines, networks, and business.

- **ETHICS IN IT:** The Great Debate: Is macOS Safer Than Windows? .................................................................................. 164

- What the Operating System Does ............................................................................................................................................ 165
  - The User Interface ............................................................................................................................................................... 166
  - **Objective 5.4** Explain how the operating system provides a means for users to interact with the computer.
  - Hardware Coordination ......................................................................................................................................................... 166
  - **Objective 5.5** Explain how the operating system helps manage hardware such as the processor, memory, storage, and peripheral devices.
  - **SOUND BYTE:** Using Windows Task Manager to Evaluate System Performance .......................................................... 166
  - Software Application Coordination ....................................................................................................................................... 168
  - **Objective 5.6** Explain how the operating system interacts with application software.
  - **TRENDS IN IT:** Are Personal Computers Becoming More Human? .............................................................................. 169

- Starting Your Computer ......................................................................................................................................................... 170
  - The Boot Process ............................................................................................................................................................... 170
  - **Objective 5.7** Discuss the process the operating system uses to start up the computer and how errors in the boot process are handled.
Learning Outcome 6.1 You will be able to evaluate your computer system’s hardware functioning, including the CPU and memory subsystems.

Chapter 6

Understanding and Assessing Hardware: Evaluating Your System ............... 198

Part 1: Evaluating Key Subsystems ................................................................. 200

Learning Outcome 6.1 You will be able to evaluate your computer system’s hardware functioning, including the CPU and memory subsystems.

Your Ideal Computing Device ................................................................. 200

Moore’s Law .................................................. 200

Objective 6.1 Describe the changes in CPU performance over the past several decades.

Selecting a Computing Device ................................................................. 201

Objective 6.2 Compare and contrast a variety of computing devices.

Evaluating the CPU Subsystem ................................................................. 203

How the CPU Works .................................................. 203

Objective 6.3 Describe how a CPU is designed and how it operates.

BITs&BYTES: Liquid Cooling ................................................................. 207

Measuring CPU Performance ................................................................. 207

Objective 6.4 Describe tools used to measure and evaluate CPU performance.

DIG DEEPER: The Machine Cycle ......................................................... 209

Evaluating the Memory Subsystem ................................................................. 210

Random Access Memory .................................................. 210

Objective 6.5 Discuss how RAM is used in a computer system.

Adding RAM .................................................. 212

Objective 6.6 Evaluate whether adding RAM to a system is desirable.

HELPDESK: Evaluating Your CPU and RAM ........................................ 212

SOUND BYTE: Installing RAM ................................................................. 213

TRY THIS: Measure Your System Performance .................................... 215

MAKE THIS: TOOL: App Inventor 2 or Thunkable ................................ 216
Part 2: Evaluating Other Subsystems and Making a Decision ................................................................. 217

Learning Outcome 6.2 You will be able to evaluate your computer system’s storage subsystem, media subsystem, and reliability and decide whether to purchase a new system or upgrade an existing one.

Evaluating the Storage Subsystem ........................................................................................................ 217
   Types of Storage Drives ...................................................................................................................... 217
   Objective 6.7 Classify and describe the major types of nonvolatile storage drives.
   SOUND BYTE: Installing an SSD Drive .............................................................................................. 218
   DIG DEEPER: How Storage Devices Work ........................................................................................ 219
   Storage Needs .................................................................................................................................... 220
   Objective 6.8 Evaluate the amount and type of storage needed for a system.
   BITS&BYTES: How Much Storage to Buy? ...................................................................................... 222

Evaluating the Media Subsystems .......................................................................................................... 223
   Video Cards ........................................................................................................................................ 223
   Objective 6.9 Describe the features of video cards.
   BITS&BYTES: Graphics Cards with SSD on Board .......................................................................... 225
   TRENDS IN IT: USB 3.1 and USB-C ................................................................................................. 226
   Sound Cards ........................................................................................................................................ 227
   Objective 6.10 Describe the features of sound cards.
   HELPDISK: Evaluating Computer System Components ..................................................................... 227

Evaluating System Reliability and Moving On .................................................................................. 229
   Maintaining System Reliability .......................................................................................................... 229
   Objective 6.11 Describe steps you can take to optimize your system’s reliability.
   Getting Rid of Your Old Computer ................................................................................................... 231
   Objective 6.12 Discuss how to recycle, donate, or dispose of an older computer.
   ETHICS IN IT: Free Hardware for All ................................................................................................ 232
   SOLVE THIS: Laptop Alternatives ..................................................................................................... 239

Chapter 7

Networking: Connecting Computing Devices ..................................................................................... 240

Part 1: How Networks Function ......................................................................................................... 242

Learning Outcome 7.1 You will be able to explain the basics of networking, including the components needed to create a network, and describe the different ways a network can connect to the Internet.

Networking Fundamentals .................................................................................................................... 242
   Understanding Networks .................................................................................................................... 242
   Objective 7.1 Describe computer networks and their pros and cons.
   HELPDISK: Understanding Networking .......................................................................................... 243

Network Architectures .......................................................................................................................... 244
   Network Designs ............................................................................................................................... 244
   Objective 7.2 Explain the different ways networks are defined.
   DIG DEEPER: P2P File Sharing ........................................................................................................ 246

Network Components ........................................................................................................................... 247
   Transmission Media ............................................................................................................................. 247
   Objective 7.3 Describe the types of transmission media used in networks.
   SOUND BYTE: Installing a Home Computer Network .................................................................... 247
   Basic Network Hardware .................................................................................................................... 249
   Objective 7.4 Describe the basic hardware devices necessary for networks.
   Network Software ............................................................................................................................... 250
   Objective 7.5 Describe the type of software necessary for networks.
   TRENDS IN IT: How Smart Is Your Home? .................................................................................. 251
Managing Your Digital Lifestyle: Challenges and Ethics ................................................. 272

Chapter 8

Part 1: The Impact of Digital Information ........................................................................ 274

Learning Outcome 8.1 You will be able to describe the nature of digital signals; how digital technology is used to produce and distribute digital texts, music, and video; and the challenges in managing a digital lifestyle.

Digital Basics .................................................................................................................. 274

Objective 8.1 Describe how digital convergence and the Internet of Things have evolved.

Digital Publishing ............................................................................................................. 278

Objective 8.3 Describe the different types of e-readers.

Objective 8.4 Explain how to purchase, borrow, and publish e-texts.

Digital Music .................................................................................................................... 280

Objective 8.5 Describe how digital music is created and stored.

Objective 8.6 Summarize how to listen to and publish digital music.
Digital Media .......................................................................................................................................................... 283
Digital Photography ............................................................................................................................................... 283

Objective 8.7 Explain how best to create, print, and share digital photos.

SOUND BYTE: Enhancing Photos with Image-Editing Software .............................................................................. 284
Digital Video .......................................................................................................................................................... 285

Objective 8.8 Describe how to create, edit, and distribute digital video.

TRENDS IN IT: Digital Asset Managers Needed! ................................................................................................. 288

Part 1: Threats to Your Digital Assets .................................................................................................................. 324

Identity Theft and Hackers .................................................................................................................................... 324
Identity Theft .......................................................................................................................................................... 325

Objective 9.1 Describe how identity theft is committed and the types of scams identity thieves perpetrate.

Part 2: Ethical Issues of Living in the Digital Age .................................................................................................. 297

Learning Outcome 8.2 You will be able to describe how to respect digital property and use it in ways that maintain your digital reputation.

Protection of Digital Property ................................................................................................................................ 297
Intellectual Property .................................................................................................................................................. 297

Objective 8.10 Describe the various types of intellectual property.

Copyright Basics ....................................................................................................................................................... 298

Objective 8.11 Explain how copyright is obtained and the rights granted to the owners.

HELPDESK: Understanding Intellectual Property and Copyright ............................................................................. 300

Copyright Infringement ......................................................................................................................................... 301

Objective 8.12 Explain copyright infringement, summarize the potential consequences, and describe situations in which you can legally use copyrighted material.

BITS&BYTES: Software Piracy: It’s More Than Just Downloading and Copying .......................................................... 303
BITS&BYTES: Your Tax Dollars at Work: Free Media without Permission! .................................................................. 305

Living Ethically in the Digital Era .......................................................................................................................... 306

Plagiarism ................................................................................................................................................................. 306

Objective 8.13 Explain plagiarism and strategies for avoiding it.

Hoaxes and Digital Manipulation ............................................................................................................................ 308

Objective 8.14 Describe hoaxes and digital manipulation.

SOUND BYTE: Plagiarism and Intellectual Property ............................................................................................ 308

Protecting Your Online Reputation .......................................................................................................................... 311

Objective 8.15 Describe what comprises your online reputation and how to protect it.

BITS&BYTES: Celebrity Photographic Rights .......................................................................................................... 313
ETHICS IN IT: Acceptable Use Policies: What You Can and Can’t Do ...................................................................... 314
SOLVE THIS: Intellectual Property and Copyright Basics .......................................................................................... 321

Chapter 9
Securing Your System: Protecting Your Digital Data and Devices ................................................................. 322

Part 1: Threats to Your Digital Assets .................................................................................................................. 324

Learning Outcome 9.1 You will be able to describe hackers, viruses, and other online annoyances and the threats they pose to your digital security.

Identity Theft and Hackers .................................................................................................................................... 324
Identity Theft .......................................................................................................................................................... 325

Objective 9.1 Describe how identity theft is committed and the types of scams identity thieves perpetrate.
Learning Outcome 9.2 Describe various ways to protect your digital property and data from theft and corruption.

Part 2: Protecting Your Digital Property ........................................................................................................................... 343

Keeping Your Data Safe .......................................................................................................................................................... 352

Protecting Your Physical Computing Assets .......................................................................................................................... 357
Chapter 10

Behind the Scenes: Software Programming ......................................................... 368

Part 1: Understanding Programming ............................................................... 370

Learning Outcome 10.1 You will be able to describe the life cycle of a software project and identify the stages in the program development life cycle.

Life Cycle of an Information System .............................................................. 370
   The Importance of Programming ................................................................. 370
   Objective 10.1 Describe the importance of programming to both software developers and users.
   System Development Life Cycle ................................................................. 370
   Objective 10.2 Summarize the stages of the system development life cycle.
   BITS&BYTES: Let Them See Your Work .................................................. 372

Life Cycle of a Program .................................................................................. 372
   The Program Development Life Cycle ....................................................... 372
   Objective 10.3 Define programming and list the steps in the program development life cycle.
   The Problem Statement ........................................................................... 373
   Objective 10.4 Describe how programmers construct a complete problem statement from a description of a task.
   SOUND BYTE: Using the Arduino Microcontroller .................................. 373
   HELPDESK: Understanding Software Programming .................................. 374
   Algorithm Development ........................................................................... 375
   Objective 10.5 Explain how programmers use flow control and design methodologies when developing algorithms.
   BITS&BYTES: Hackathons ......................................................................... 378
   DIG DEEPER: The Building Blocks of Programming Languages: Syntax, Keywords, Data Types, and Operators .......................... 380
   Coding ....................................................................................................... 381
   Objective 10.6 Discuss the categories of programming languages and the roles of the compiler and the integrated development environment in coding.
   Debugging ................................................................................................. 387
   Objective 10.7 Identify the role of debugging in program development.
   BITS&BYTES: Many Languages on Display .......................................... 388
   Testing and Documentation ...................................................................... 388
   Objective 10.8 Explain the importance of testing and documentation in program development.
   TRY THIS: Programming with Corona ................................................. 390
   MAKE THIS: TOOL: App Inventor 2 or Thunkable ................................. 391

Part 2: Programming Languages ................................................................... 392

Learning Outcome 10.2 You will understand the factors programmers consider when selecting an appropriate programming language for a specific problem and will be familiar with some modern programming languages.

Many Programming Languages ...................................................................... 392
   Need for Diverse Languages .................................................................... 392
   Objective 10.9 Discuss the driving factors behind the popularity of various programming languages.
   SOUND BYTE: Programming with the Processing Language................. 392
   Selecting the Right Language .................................................................. 393
   Objective 10.10 Summarize the considerations in identifying an appropriate programming language for a specific setting.
   BITS&BYTES: Coding for Zombies ......................................................... 393
   ETHICS IN IT: When Software Runs Awry ............................................ 394

Exploring Programming Languages .............................................................. 395
   Tour of Modern Languages ..................................................................... 395
   Objective 10.11 Compare and contrast modern programming languages.
   BITS&BYTES: Your Software Portfolio .................................................. 399
   TRENDS IN IT: Emerging Technologies: Unite All Your Video Game Design Tools ......................................................... 403
Chapter 11

Behind the Scenes: Databases and Information Systems

Part 1: Database Fundamentals

Learning Outcome 11.1 You will be able to explain the basics of databases, including the most common types of databases and the functions and components of relational databases in particular.

The Need for Databases

Database Basics

Objective 11.1 Explain what a database is and why databases are useful.

Database Types

Flat Databases

Objective 11.2 Describe features of flat databases.

Relational Databases

Objective 11.3 Describe features of relational databases.

Object-Oriented Databases

Objective 11.4 Describe features of object-oriented databases.

Multidimensional Databases

Objective 11.5 Describe features of multidimensional databases.

NoSQL Databases

Objective 11.6 Describe how Web 2.0 data is managed in a database.

Using Databases

Relational Database Components and Functions

Objective 11.7 Describe how relational databases organize and define data.

Structured Query Language (SQL)

Objective 11.8 Describe how data is inputted and managed in a database.

Using SQL

Objective 11.9 Explain what data warehouses and data marts are and how they are used.

Data Warehousing and Storage

Data Warehouses and Data Marts

Objective 11.10 Describe data mining and how it works.

Hadoop: How Big Data Is Being Managed

Data Mining

ETHICS IN IT: Data, Data Everywhere—But Is It Protected?
Chapter 12

Behind the Scenes: Networking and Security in the Business World ............. 456

Part 1: Client/Server Networks and Topologies ................................................................. 458

Learning Outcome 12.1 You will be able to describe common types of client/server networks, servers found on them, and network topologies used to construct them.

Client/Server Network Basics .......................................................................................................................... 458
Networking Advantages ............................................................................................................................................. 458
Objective 12.1 List the advantages for businesses of installing a network.
Comparing Client/Server and Peer-to-Peer Networks .......................................................................................... 459
Objective 12.2 Explain the differences between a client/server network and a peer-to-peer network.
Types of Client/Server Networks ...................................................................................................................... 460
Objective 12.3 Describe the common types of client/server networks as well as other networks businesses use.

Servers and Network Topologies .......................................................................................................................... 464
Servers ........................................................................................................................................................................ 464
Objective 12.4 List the common types of servers found on client/server networks.
HELPDESK: Using Servers ................................................................................................................................. 465
TRENDS IN IT: Virtualization: Making Servers Work Harder .............................................................................. 466
Network Topologies ............................................................................................................................................... 467
Objective 12.5 Describe the common types of network topologies and the advantages and disadvantages of each one.

Part 2: Setting Up Business Networks ................................................................................................. 476

Learning Outcome 12.2 You will be able to describe transmission media, network operating system software, and network navigation devices and explain major threats to network security and how to mitigate them.

Transmission Media ................................................................................................................................................. 476
Wired and Wireless Transmission Media .................................................................................................................. 476
Objective 12.6 Describe the types of wired and wireless transmission media used in networks.

BITS&BYTES: Go Green with Mobile Apps ............................................................................................................... 478
Network Adapters and Navigation Devices ........................................................................................................... 478
Network Adapters .................................................................................................................................................... 478
Objective 12.7 Describe how network adapters help data move around a network.
MAC Addresses ......................................................................................................................................................... 480
Objective 12.8 Define MAC addresses, and explain how they are used to move data around a network.
Switches, Bridges, and Routers ............................................................................................................................ 481
Objective 12.9 List the various network navigation devices, and explain how they help route data through networks.
HELPDESK: Transmission Media and Network Adapters ...................................................................................... 482

Network Operating Systems and Network Security .......................................................................................... 482
Network Operating Systems ................................................................................................................................. 483
Objective 12.10 Explain why network operating systems are necessary for networks to function.

BITS&BYTES: Smart Lighting for Smart Homes ................................................................................................. 483
Chapter 13

Behind the Scenes: How the Internet Works ......................................................................................................................... 498

Part 1: Inner Workings of the Internet ........................................................................................................................................... 500

Learning Outcome 13.1 You will be able to explain how the Internet is managed and the details of how data is transmitted across the Internet.

Internet Management and Networking ........................................................................................................................................ 500
  Management .............................................................................................................................................................................. 500
  Objective 13.1 Describe the management of the Internet.
  Networking Components ............................................................................................................................................................. 501
  Objective 13.2 Explain how the Internet’s networking components interact.
  Data Transmission .................................................................................................................................................................... 502
  Objective 13.3 List and describe the Internet protocols used for data transmission.
  BITS&BYTES: A Free Cloud-Based Server for You .................................................................................................................. 502

Internet Identity ............................................................................................................................................................................. 505
  IP Addresses .............................................................................................................................................................................. 505
  Objective 13.4 Explain how each device connected to the Internet is assigned a unique address.
  HELPDESK: Understanding IP Addresses, Domain Names, and Protocols ............................................................................. 505
  BITS&BYTES: What’s Your IP Address? ................................................................................................................................ 506
  BITS&BYTES: Internet of Things Goes Shopping .......................................................................................................................... 506
  SOUND BYTE: Creating Web Pages with Squarespace ............................................................................................................... 507
  DIG DEEPER: Connection-Oriented Versus Connectionless Protocols ..................................................................................... 508
  Domain Names ............................................................................................................................................................................ 509
  Objective 13.5 Discuss how a numeric IP address is changed into a readable name.
  BITS&BYTES: Scale Up for Success .................................................................................................................................... 510
  TRY THIS: Ping Me ................................................................................................................................................................... 513
  MAKE THIS: TOOL App Inventor 2 or Thunkable ..................................................................................................................... 514

Part 2: Coding and Communicating on the Internet .................................................................................................................. 515

Learning Outcome 13.2 You will be able to describe the web technologies used to develop web applications.

Web Technologies ............................................................................................................................................................................ 515
  Web Development ....................................................................................................................................................................... 515
  Objective 13.6 Compare and contrast a variety of web development languages.
  BITS&BYTES: CodePen: An Editing Community for Web Designers .......................................................................................... 516
  Application Architecture .............................................................................................................................................................. 518
  Objective 13.7 Compare and contrast server-side and client-side application software.
  SOUND BYTE: Client-Side Web Page Development ................................................................................................................ 519
  BITS&BYTES: Free Code Camp ............................................................................................................................................... 521

Communications over the Internet ................................................................................................................................................ 521
  Types of Internet Communication ........................................................................................................................................... 521
  Objective 13.8 Discuss the mechanisms for communicating via e-mail and instant messaging.
  BITS&BYTES: AI and Your Inbox ............................................................................................................................................. 523
  Encryption .................................................................................................................................................................................. 524
  Objective 13.9 Explain how data encryption improves security.
BIT&SBYTES: Numbers: We Wouldn’t Have Encryption Without Them! .......................................................... 525
ETHICS IN IT: Do We Really Want Strong Encryption? .................................................................................... 526
HELPDESK: Keeping E-Mail Secure .............................................................................................................. 526
TRENDS IN IT: Cognitive Computing ........................................................................................................... 527
SOLVE THIS: Creating an HTML Document .................................................................................................. 535

Appendix A
The History of the Personal Computer ................................................................. A-1

Appendix B
Careers in IT .............................................................................................................................................. B-1
Glossary ....................................................................................................................................................... G-1
Index ........................................................................................................................................................... I-1
The best-selling Technology in Action continues to deliver an engaging approach to teaching the topics and skills students need to be digitally literate. Using practical content, hands-on projects, and interactive simulation activities students are engaged in learning.

Today’s students are more tech savvy than ever—they know how to use their smartphones, YouTube, Snapchat, and Instagram—and that’s how they want to learn. Technology in Action is written knowing that many students are digital natives, so the instruction and practice offer students a consistent and engaging experience from chapter to chapter. They don’t just read about technology, they engage with it in familiar ways.

For the 16th edition, students will engage with their peers at the beginning of each chapter of the etext by taking a Web-based survey and then analyzing the results with What Do You Think? questions. From there students continue to engage with the content by watching videos, working through interactive Helpdesk activities, Sound Byte lessons, IT simulations, and a variety of hands-on projects. Using these resources and the practical content, students learn the concepts and skills they need to be digitally literate in today’s workplace. And, if they are using MyLab IT, they can earn the Digital Competency badge to demonstrate their skills to potential employers.

Hallmarks

- Engaging question-and-answer writing style that approaches topics as students do.

- Ethics coverage throughout, including in end-of-chapter activities, Point/Counterpoint ethical debate content found in relevant chapters, and a Sound Byte lesson on how to discuss and debate ethical issues.

- Hands-on learning with projects throughout each chapter:
  - Try This projects allow students to practice and demonstrate their proficiency with important topics. Each project is accompanied by a how-to video.
  - Solve This projects put the concepts students are learning into action through real-world problem solving using Microsoft Office programs. Grader project versions of most of these projects are in MyLab IT.
  - Make This projects provide activities where students build programs that run on their mobile devices. Twelve of the chapters have activities that build fully functional mobile apps, compatible with either Android or iOS. Each project includes instructions and a how-to video.

- Interactive activities engage students in active learning and demonstration of understanding:
  - Helpdesk interactive activities provide a review of chapter objectives by having students play the role of a helpdesk staffer assisting customers via a live chat using a decision-based simulation with a quiz.
  - Sound Byte audio lessons provide coverage of additional topics related to the chapter, including a brief quiz.
  - IT Simulations provide an in-depth chapter scenario that students work through in an active learning environment and complete with a brief quiz to demonstrate understanding. Newly redesigned for a more engaging and easier-to-use learning experience that helps students actively demonstrate understanding. Now includes a “presentation mode” so instructors can walk through the simulation in class or with students.

- Review and Quizzes
  - Check Your Understanding Quizzes provide a self-check covering objectives in each part of the chapter so that students can see how well they are learning the content.
  - The Chapter Quiz provides a way for students to test that they have learned the material from the entire chapter.
  - New “Chew on This” critical thinking questions require that students demonstrate their understanding through written answers that are manually graded.

- Testbank Exams provide customizable prebuilt, autograded, objective-based questions covering the chapter objectives.

- Videos
  - Chapter Overview Videos provide an objective-based review of what students should have learned.

- Try This and Make This project videos

- Helpful Resources
  - PowerPoint and Audio Presentations can be used in class for lecture or assigned to students, particularly online students, for instruction and review.
  - Instructor Chapter Guides provide teaching tips; homework and assessment suggestions; a brief overview of each chapter’s Try This, Make This, and Solve This exercises; as well as select Sound Byte talking points and ethics debate starters.
What’s New?

- **What Do You Think?** discussion topics begin each chapter with surveys that students complete. They then respond to follow-up questions related to the topic at the end of the chapter to encourage critical thinking.
- **Chew on This** critical thinking questions at the end of each chapter part, encourage students to think critically about the impact of technology on society.
- **Technology in the News** (formerly TechBytes Weekly) lets you keep your class current with weekly technology news. This currency widget is included in the etext or Revel versions of Technology in Action to provide new and updated content, discussion points, and activities every week.
- **Chapter 8** has been expanded to discuss the challenges students face in managing an active digital lifestyle such as the Dark Web, keeping data private, and using cryptocurrency.
- **Images and quizzes** have been updated throughout.
- A new **Try This project in Chapter 1**—What Does Facebook Know About You?—lets students explore the detailed information collected about them by the social media platform.

Summary of Chapter Updates

All chapter Learning Outcomes and Learning Objectives have been revised as needed and throughout the text, figures and photos have been updated with new images, current topics, and state-of-the art technology coverage.

- **Chapter 1**
  A new **Try This** exercise leading students through the steps to examine the data stored about them by social media platforms has been added.
  The section on technology and careers has been updated with current trends and an emphasis on the impact of artificial intelligence.

- **Chapter 5**
  Discussions on additional mobile operating systems like watchOS and tvOS have been added.
  Coverage of the latest smarthome devices and open-source solutions has been added.

- **Chapter 7**
  The **Bits&Bytes: Net Neutrality** has been updated.
  The **Bits&Bytes: Is Dial-Up Still an Option?** has been updated.
  The **Bits&Bytes: 5G Is Coming—Is It Worth the Wait?** has been deleted and content has been added to the text.
  Ethics in IT: Ethical Challenges of the Internet of Things has moved to Chapter 8.
  A new **Bits&Bytes: Power Your Devices Wirelessly** has been added.
  Revisions to setting up a Windows home network have been made to remove concept of homegroups.
  The **Bits&Bytes: The Rise of Wearable Technology** has moved to Chapter 8.
  A new **Ethics in IT: Privacy Challenges of Delivering Free Wi-Fi** has been added.

- **Chapter 8**
  Ethics in IT: Ethical Challenges of the Internet of Things has been relocated from Chapter 7.
  A new objective, “Discuss the challenges in managing an active digital lifestyle,” has been added to the chapter.
  A new **Dig Deeper, Deep Web versus Dark Web: Are There Places You Shouldn’t Go?**, has been added to the chapter.
  **Bits&Bytes: The Rise of Wearable Technology** has been relocated from Chapter 7.

- **Chapter 9**
  A **Bits&Bytes** addressing the role of social media and computer security in maintaining democratic elections has been added.
  Extended treatment of password managers and biometric options for access control has been added.

- **Chapter 10**
  New coverage of programming technologies like Swift and JSON.

- **Chapter 11**
  The concept of flat databases has replaced discussion of lists.
  New content of NoSQL databases has been added.
  The content of data staging has been updated.
  A new **Bits&Bytes: The Normal Forms** has been added.

- **Chapter 12**
  A new **Try This: Sharing Printers on a Network Using Windows** has been added.

- **Chapter 13**
  Coverage of web security topics like email encryption and biometrics has been updated.
  The most current coverage of cognitive computing has been added.
  More student-focused introduction to web frameworks and modern web technologies has been added.
The Program

To maximize student results, we recommend using *Technology in Action* with MyLab IT, the teaching and learning platform that empowers you to reach every student. By combining trusted author content with digital tools and a flexible platform, MyLab IT personalizes the learning experience and will help your students learn and retain key course concepts while developing skills that future employers seek.

With MyLab IT for *Technology in Action*, students have access to all of the instruction, practice, review, and assessment resources in one place. There are two ways you can set up your course:

1. You can choose to use the new sequential learning modules that allow you to create activities in the order you want students to complete them, providing a consistent, measurable learning experience from chapter to chapter.

2. You can take a second approach for an interactive learning experience, where students use the interactive etext to read and learn actively with Helpdesk activities, Sound Bytes, IT Simulations, What’s New in Technology currency updates, What do You Think? surveys and critical thinking questions, hands-on projects, videos, accessible PowerPoint presentations, and more. You assign the etext chapter, students engage in learning and practice, and go back to their assignments to take the chapter quizzes.

Solving Teaching and Learning Challenges

*Technology in Action*, 16e provides a hands-on approach to learning computer concepts in which students learn a little and then apply what they are learning in a project or simulation or watch a video to dive deeper. Within the etext, students are engaged through interactive surveys, What’s New in Technology currency updates, videos, IT Simulations, interactives, fun study tools, and quiz questions with immediate feedback. And with the new What do you think? surveys at the beginning of each chapter, the follow-up question at the end of the chapter related to the survey results, as well as new Chew on This critical thinking questions at the end of each chapter part, students are encouraged to think critically about the impact of technology on society.

The optimal way to experience *Technology in Action* is with MyLab IT. All of the instruction, practice, review, and assessment resources are in one place, allowing you to arrange your course from an instructional perspective that gives students a consistent, measurable learning experience from chapter to chapter.

Developing Employability Skills

Digital literacy is a top skill required in today’s job market! Developing these skills involves conceptual as well as hands-on learning. With *Technology in Action*, students get both—they learn the fundamentals of computers and have opportunities to apply what they are learning in real-world projects and simulations. Using MyLab IT and *Technology in Action*, students can learn, practice, and demonstrate their digital literacy.

- **High-Demand Office Skills** are evaluated in the auto-graded Solve This projects in each chapter.
- **Essential Digital Literacy Skills** are taught and practiced throughout the book in Try This, Solve This, and Make This projects.
<table>
<thead>
<tr>
<th></th>
<th>Ethics Projects</th>
<th>Try This Projects</th>
<th>Solve This Projects</th>
<th>Make This Projects</th>
<th>What do you think?</th>
<th>Interactivities: Helpdesks, Sound Bytes, IT Sims</th>
<th>Team Time Projects</th>
<th>Badge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Thinking</td>
<td>X</td>
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<tr>
<td>Collaboration</td>
<td>X</td>
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<td>X</td>
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<td>Knowledge Application and Analysis</td>
<td>X</td>
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<td>X</td>
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<td></td>
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<td>Social Responsibility</td>
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Applied Learning Opportunities Throughout

Using MyLab IT with *Technology in Action* provides students with a variety of ways to get instruction, practice, review, and assessment.

**Technology in the News**

Formerly *TechBytes Weekly*, these weekly currency updates deliver the latest technology news stories to you to use in your classroom. The update is live in the etext chapter, so no matter where you are in the content, you’ll have this weekly update to use for in-class discussion or as a reading assignment.

**Try This Projects**

These projects have students apply what they are learning in a practical project that uses skills they’ll need in the workforce and everyday life. Each project includes a video to guide students through the project.

**Make This Projects**

These hands-on activities lead students to explore mobile app development in either an Android or iOS environment.

**Helpdesk Activities**

The Helpdesk training content, created specifically for *Technology in Action*, enables students to take on the role of a helpdesk staffer fielding questions posed by computer users so that students demonstrate their understanding in an active learning environment. Each Helpdesk ends with a quiz, ensuring students have grasped the content.

**Sound Bytes**

Sound Bytes expand student mastery of complex topics through engaging lessons with a brief quiz to check understanding.

**Solve This Projects**

These exercises integrate and reinforce chapter concepts with Microsoft Office skills.

**IT Simulations**

These detailed interactive scenarios cover a core chapter topic in a hands-on environment where students can apply what they have learned and demonstrate understanding through active engagement.

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Learn Technology by Using *Technology in Action* 16e xxiii
Instructor Teaching Resources

This program comes with the following teaching resources.

<table>
<thead>
<tr>
<th>Supplements available to instructors at <a href="http://www.pearsonhighered.com/techinaction">www.pearsonhighered.com/techinaction</a></th>
<th>Features of the Supplement</th>
</tr>
</thead>
</table>
| Accessible PowerPoint Presentation | PowerPoints meet accessibility standards for students with disabilities. Features include, but are not limited to:  
  - Keyboard and Screen Reader Access  
  - Alternative Text for Images  
  - High Color Contrast between Background and Foreground Colors |
| End-of-Chapter Answer Key, Check Your Understanding Answer Key, Chapter Quiz Answer Key | Answers to all end-of-chapter questions. |
| Image Library | Every image in the book. |
| Instructor Chapter Guide |  
  - Content Instruction  
  - Student Preparation and Review  
  - Active Learning Options  
  - Chapter Assessment  
  - End-of-Chapter Exercises  
  - Currency Topics  
  - Soft Skills and Team Work  
  - Instructor Resources |
| Make This Projects | Activities where students build programs that run on their mobile devices. Each project includes instructions and a how-to video. |
| Objectives Mapping | Outline of the objectives in every chapter. |
| Solve This Projects | Real-world problem solving using Microsoft Office programs. Grader versions of most of these projects are in MyLab IT. |
| Syllabus Template | Sample syllabus for help in setting up your course. |
| Test Bank (Textbook, Helpdesk, Sound Bytes) | Over 1,000 multiple-choice, true/false, short-answer, and matching questions with these annotations:  
  - Difficulty level (1 for straight recall, 2 for some analysis, 3 for complex analysis)  
  - Objective, which provides location in the text  
  Provided for:  
  - Textbook  
  - Helpdesk  
  - Sound Byte |
| Computerized TestGen | TestGen allows instructors to:  
  - Customize, save, and generate classroom tests  
  - Edit, add, or delete questions from the Test Item files  
  - Analyze test results  
  - Organize a database of tests and student results |
| Transition Guide | Detailed explanation of changes between the previous and current edition. |
| Web Projects | Discussion questions and additional projects that can be done on the Internet. |
Our 16th Edition—A Letter from the Authors

Why We Wrote This Book

The pace of technological change is ever increasing. In education, we have seen this impact us more than ever recently—the Maker movement, the Internet of Things, MOOCs, touch-screen mobile delivery, and Hangouts are now fixed parts of our environment.

Even the most agile of learners and educators need support in keeping up with this pace of change. Our students have easier access to more information than any generation before them. We recognize the need for them to be able to think critically and investigate the data they see. In this edition, we introduce the use of chapter-opening features called *What do you think?* that allow students to critically think about a chapter topic. Students then follow up at the end of the chapter by answering additional related critical thinking questions in a *What do you think now?* feature.

We have also responded by integrating material to help students develop skills for web application and mobile programming. We see the incredible value of these skills and their popularity with students and have included *Make This* exercises for each chapter. These exercises gently bring the concepts behind mobile app development to life. In addition, there is a *Solve This* exercise in each chapter that reinforces chapter content while also applying Microsoft Office skills. These projects help to promote students’ critical-thinking and problem-solving skills, which employers value highly.

The Helpdesk and Sound Byte training modules and IT Simulations continue to provide students with an active learning environment in which they can reinforce their learning of chapter objectives. In this edition, we have put the spotlight on critical thinking. We’ve integrated real-time surveys on important technology topics to foster classroom discussion and analytical skills. We have also included additional material on key challenges of a digital lifestyle, such as using digital currency, avoiding the Dark Web, and protecting privacy.

We also continue to emphasize the many aspects of ethics in technology debates. Some of the Helpdesks and IT Simulations support instruction on how to conduct thoughtful and respectful discussion on complex ethical issues.

Our combined 70 years of teaching computer concepts have coincided with sweeping innovations in computing technology that have affected every facet of society. From iPads to Web 2.0, computers are more than ever a fixture of our daily lives—and the lives of our students. But although today’s students have a much greater comfort level with their digital environment than previous generations, their knowledge of the machines they use every day is still limited.

Part of the student-centered focus of our book has to do with making the material truly engaging to students. From the beginning, we have written *Technology in Action* to focus on what matters most to today’s student. Instead of a history lesson on the microchip, we focus on tasks students can accomplish with their computing devices and skills they can apply immediately in the workplace, in the classroom, and at home.

We strive to keep the text as current as publishing timelines allow, and we are constantly looking for the next technology trend or gadget. We have augmented the etext with weekly *What’s New in Technology* automatic updates. These updates will be in each chapter, so regardless of where you are in the text, you’ll have current topics to talk about in class related to the latest breaking developments.

We also continue to include a number of multimedia components to enrich the classroom and student learning experience. The result is a learning system that sparks student interest by focusing on the material they want to learn (such as how to integrate devices into a home network) while teaching the material they need to learn (such as how networks work). The sequence of topics is carefully set up to mirror the typical student learning experience.
As they read this text, your students will progress through stages and learning outcomes of increasing difficulty:

- Thinking about how technology offers them the power to change their society and their world and examining why it’s important to be computer fluent
- Understanding the basic components of computing devices
- Connecting to and exploring the Internet
- Exploring application software
- Learning about the operating system and personalizing their computer
- Evaluating and upgrading computing devices
- Understanding home networking options
- Creating digital assets and understanding how to legally distribute them
- Keeping computing devices safe from hackers
- Going behind the scenes, looking at technology in greater detail

We strive to structure the book in a way that makes navigation easy and reinforces key concepts. We continue to design the text around learning outcomes and objectives, making them a prominent part of the chapter structure. Students will see the learning outcomes and objectives in the chapter opener, throughout the text itself, as well as in the summary so they understand just what they are expected to learn.

We also continue to structure the book in a progressive manner, intentionally introducing on a basic level in the earlier chapters concepts that students traditionally have trouble with and then later expanding on those concepts in more detail when students have become more comfortable with them. Thus, the focus of the early chapters is on practical uses for the computer, with real-world examples to help the students place computing in a familiar context. For example, we introduce basic hardware components in Chapter 2, and then we go into increasingly greater detail on some hardware components in Chapter 6. The Behind the Scenes chapters venture deeper into the realm of computing through in-depth explanations of how programming, networks, the Internet, and databases work. They are specifically designed to keep more experienced students engaged and to challenge them with interesting research assignments.

In addition to extensive review, practice, and assessment content, each chapter contains several problem-solving, hands-on activities that can be carried out in the classroom or as homework:

- The *Try This* exercises lead students to explore a particular computing feature related to the chapter.
- The *Make This* exercises are hands-on activities that lead students to explore mobile app development in both the Android and iOS environments.
- The *Solve This* exercises integrate and reinforce chapter concepts with Microsoft Office skills.

Throughout the years we have also developed a comprehensive multimedia program to reinforce the material taught in the text and to support both classroom lectures and distance learning:

- New chapter-opening features called *What do you think?* allow students to critically think about a chapter topic. Students then follow up at the end of the chapter by answering additional related critical thinking questions in a *What do you think now?* feature.
- New *Chew on This* critical-thinking questions require that students demonstrate their understanding through written answers that are manually graded.
- The Helpdesk training content, created specifically for *Technology in Action*, enables students to take on the role of a helpdesk staffer fielding questions posed by computer users so that students can demonstrate their understanding in an active learning environment.
- Sound Bytes expand student mastery of complex topics through engaging lessons with a brief quiz to check understanding.
- IT Simulations are detailed, interactive scenarios covering the core chapter topic. As students work through the simulation, they apply what they have learned and demonstrate understanding in an active learning environment.
- The *What's New in Technology* (formerly *TechBytes Weekly*) is a weekly currency update that delivers the latest technology news stories to you for use in your classroom. In addition, the currency items have discussion points or activities included. The update is live in the etext chapters, so no matter where you are in the content, you’ll have this weekly update to use for an in-class discussion or reading assignment.
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Alan is currently a faculty member at Moore College of Art and Design and Montgomery County Community College, teaching a variety of computer science and business courses. He holds a BS in accounting from Rider University and an MS in Information Systems from Drexel University, and he is a certified public accountant. After a successful career in business, Alan finally realized that his true calling is education. He has been teaching at the college level since 2000. He enjoys attending technical conferences and exploring new methods of engaging students.

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Acknowledgments

For my wife, Patricia, whose patience, understanding, and support continue to make this work possible, especially when I stay up past midnight writing! And to my parents, Jackie and Dean, who taught me the best way to achieve your goals is to constantly strive to improve yourself through education.

—Alan Evans

For all the teachers, mentors, and gurus who have popped in and out of my life.

—Kendall Martin

For my husband, Ted, who unselfishly continues to take on more than his fair share to support me throughout this process, and for my children, Laura, Carolyn, and Teddy, whose encouragement and love have been inspiring.

—Mary Anne Poatsy

First, we would like to thank our students. We constantly learn from them while teaching, and they are a continual source of inspiration and new ideas.

We could not have written this book without the loving support of our families. Our spouses and children made sacrifices (mostly in time not spent with us) to permit us to make this dream into a reality.

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There are many people whom we do not meet at Pearson and elsewhere who make significant contributions by designing the book, illustrating, composing the pages, producing the media, and securing permissions. We thank them all.

And finally, we would like to thank the reviewers and the many others who contribute their time, ideas, and talents to this project. We appreciate their time and energy, as their comments help us turn out a better product each edition. A special thanks goes to Rick Wolff, a wonderfully talented infographic designer who helped by creating the infographics for this text.