Computers with Your Future

Part I: Buying and Upgrading Your Computer System

How much RAM is needed?

- Depends on type of applications you intend to run on your computer

Software package usually indicates RAM requirements

What type of input devices do home users require?

- Enhanced keyboard or ergonomic keyboard
- Mouse
- Joystick or wheel
- 30-bit 600x1,200 dpi color scanner
- 1- to 4-megapixel digital camera
- Microphone
- Voice recognition software
- PC video camera
### What type of input devices do SOHO users require?
- Enhanced or ergonomic keyboard
- Mouse
- Stylus and portable keyboard for handheld computer
- 36-bit 600 x 1,200 dpi color scanner
- 1- to 4-megapixel digital camera
- Microphone
- Voice recognition software
- PC video camera

### What type of input devices do mobile users require?
- Wireless mouse for notebook computer
- Trackball, touchpad, or pointing stick on notebook computer
- Stylus and portable keyboard for handheld computer
- 2- or 3-megapixel digital camera
- Voice recognition software

### What type of input devices do power users require?
- Enhanced or ergonomic keyboard
- Mouse
- Stylus and cursor for graphics tablet
- 48-bit 1,200x1,200 dpi color scanner
- 3-megapixel digital camera
- Microphone
- PC video camera

### What type of input devices do large business users require?
- Enhanced or ergonomic keyboard
- Light pen for point-of-sale terminals
- 42-bit 1,200x1,200 dpi color scanner
- OCR, OMR, bar code reader, or MICR reader
- Video camera for videoconferences
- Voice recognition software
- Microphone
- Mouse
- Touch screen
What are suggested output devices for the Home user?
- 17- or 19-inch color CRT monitor
- High-definition television
- Ink-jet color printer; or photo printer; or label printer
- Speakers and headset

What are suggested output devices for the SOHO user?
- 19- or 21-inch color CRT monitor
- Color LCD display for handheld computer
- Multifunction device; or ink-jet color printer; or laser printer, black and white
- Label printer
- Fax machine
- Speakers and headset

What are suggested output devices for the Mobile user?
- 15.4-inch color LCD display with notebook computer
- 19-inch color CRT monitor for notebook computer docking station
- Color LCD display for handheld computer
- Ink-jet color printer; or laser printer, black and white, for in-office use; or photo printer
- Portable printer
- Fax modem
- Headset
- DL data projector

What are suggested output devices for the Large Business user?
- 19- or 21-inch color CRT or LCD monitor
- 15.4-inch color LCD display for notebook computer
- Color LCD display for handheld computer
- Line printer (for large reports from mainframe)
- Laser printer, black and white
- Label printer
- Fax machine or fax modem
- Speakers and headset
- DLP data projector
- Dumb terminal
What are suggested output devices for the Power user?
- 21-inch color LCD monitor
- Photo printer; or dye sublimation printer
- Fax machine or fax modem
- Speakers and headset
- Laser printer
- Plotter

What are suggested storage devices for the Home user?
- 3.5-inch HD floppy disk drive
- 250 MB Zip® drive
- 40 GB hard disk
- Internet hard drive
- CD-ROM drive
- CD-RW/DVD drive

What are suggested storage devices for the SOHO user?
- 3.5-inch HD floppy disk drive
- 60 GB hard disk
- Internet hard drive
- CD-ROM drive
- CD-RW/DVD drive
- 20 GB Peerless drive

What are suggested storage devices for the Mobile user?
- 3.5-inch HD floppy disk drive
- 10 GB hard disk
- 1 GB PC Card hard disk
- Internet hard drive
- CD-RW/DVD drive
What are suggested storage devices for the Large Business user?
- 3.5-inch HD floppy disk drive
- 80 GB hard disk
- CD-ROM drive
- CD-RW/DVD drive
- Microfilm or microfiche
- Smart card reader
- RAID
- Tape drive
- Enterprise storage system

What are suggested storage devices for the Power user?
- 3.5-inch HD floppy disk drive
- DVD+RW drive
- 100 GB hard disk
- CD-ROM drive
- Internet hard drive
- 20 GB Peerless drive

Suggested system requirements for various types of users

Home
- Pentium® 4 or Athlon™ 600 MHz or higher
- 64 MB RAM

Small Office/Home Office
- Pentium® 4 or Athlon™ 600 MHz or higher
- 128 MB RAM

Power
- Pentium® 4 or Athlon™ 700 MHz or higher
- 128 MB RAM

Mobile
- Pentium® III or AMD-K6® -2- P 500 MHz or higher
- 64 MB RAM

Large Business
- Pentium® 4 or Athlon™ 700 MHz or higher
- 128 MB RAM
Computers with Your Future

Part II: Avoiding Risk to Your Health

Areas of concern for a healthy work environment

- Long-time computer use can lead to health complications

What precautions can reduce the chance of developing tendonitis or carpal tunnel syndrome?

- Take frequent breaks during computer session
- Use wrist rest
- Exercise hands and arms
- Minimize number of times you switch between mouse and keyboard

Hand Exercises

- Spread fingers apart for several seconds while keeping wrists straight.
- Gently pinch back fingers and then thumb.
- Dangle arms loosely at sides and then shape arms and hands.

How can you ease eyestrain when working at the computer?

- Every 10 to 15 minutes, take an eye break.
  - Look into the distance and focus on an object for 20 to 30 seconds.
  - Roll your eyes in a complete circle.
  - Close your eyes and rest them for at least a minute.
- Blink your eyes every five seconds.
- Place your monitor about an arm's length away from your eyes with the top of the screen at eye level or below.
- Use a glare screen.
- Use large fonts.
- If you wear glasses, ask your doctor for computer glasses.
- Adjust the lighting.
Ergonomics

- Applied science devoted to comfort, efficiency, and safety in workplace
- Elbows at 90° and arms and hands parallel to floor
- Keyboard height: 23” to 28”
- Adjustable backrest
- Adjustable seat
- Adjustable height chair with 5 legs for stability
- Feet flat on floor

Computer addiction

- Occurs when computer consumes someone’s entire social life
- Symptoms:
  - Craves computer time
  - Overjoyed when at computer
  - Unable to stop computer activity
  - Irritable when not at computer
  - Neglects family and friends
  - Problems at work or school

Green computing

- Involves reducing electricity and environmental wastes while using a computer
- Suggested solutions:
  - Use computers and devices that comply with the ENERGY STAR program.
  - Do not leave the computer and devices running overnight.
  - Turn off your monitor, printer, and other devices when not in use.
  - Use paperless methods to communicate.
  - Recycle paper.
  - Buy recycled paper.
  - Recycle toner cartridges.
  - Recycle old computers and printers.
  - Shop online (saves gas).
  - Telecommute (saves gas).
Computers with Your Future

Part III: Careers and Certification

What is the expected demand for computer professionals?

- Total information technology employment has increased significantly in recent years
- More than 10 million U.S. workers are employed in information technology
- About 3% of college freshmen are majoring in a computer-related field

Four Primary areas of Job Opportunities

- Companies that manufacture computer-related equipment (hardware)
- Companies that develop software
- Companies that hire IT professionals to work with these products
- Companies and organizations that provide computer-related training and education

Where can you find information on specific computer-related careers?

- Through typical job-searching methods
- Career-oriented sites on Internet
Computer hardware industry

- Consists of small and large manufacturers and distributors of computers and computer-related equipment

Some of the more popular job titles in the computer equipment industry

- Larger companies have several levels to each job title, including management careers
- Visit company Web site for career information

<table>
<thead>
<tr>
<th>Title</th>
<th>Median Salary Range (in Thousands of $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital signal processor (DSP) designer</td>
<td>87.5</td>
</tr>
<tr>
<td>Integrated circuit (IC) designer</td>
<td>101.1</td>
</tr>
<tr>
<td>Systems integrator</td>
<td>84.8</td>
</tr>
<tr>
<td>Wireless designer</td>
<td>84.1</td>
</tr>
</tbody>
</table>

Computer software industry

- Composed of companies that develop, manufacture, and support wide range of software products

Some career opportunities in the software industry

- Involve designing and programming all kinds of software products

<table>
<thead>
<tr>
<th>Computer Software Industry Positions</th>
<th>Education Requirements</th>
<th>Salary Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmer/Analyst</td>
<td>B.S. in Computer Science or Electrical Engineering</td>
<td>$55,000 to $70,000</td>
</tr>
<tr>
<td>Project developer</td>
<td>B.S. in Computer Science, Software Engineering, or Electrical Engineering</td>
<td>$60,000 to $80,000</td>
</tr>
<tr>
<td>Systems engineer</td>
<td>B.S. in Computer Science or Electrical Engineering</td>
<td>$55,000 to $85,000</td>
</tr>
</tbody>
</table>
IT professional

- Sets up and manages computer equipment and software in IT department
- Includes programmers and systems analysts

<table>
<thead>
<tr>
<th>IT professional</th>
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Career opportunities in education and training

- Schools, colleges, universities, and private companies all need qualified instructors

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Job categories in IT department

- Management
- System development
- Operations
- Technical services
- End-user computing

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<tr>
<td>Operations</td>
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<tr>
<td>Technical services</td>
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<td>End-user computing</td>
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</tbody>
</table>

Careers in computer sales

- Sales representatives must have general understanding of computers and specific knowledge of product they are selling

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<td>Sales representatives must have general understanding of computers and specific knowledge of product they are selling</td>
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</tbody>
</table>
Careers in service and repair

- Challenging for individuals who like to troubleshoot and solve problems
- Have a strong background in electronics

Consultant

- Individual who draws upon experiences to give advice to others

First steps in preparing for a career in the computer industry

- First must decide on the area in which you are interested
- Obtain education in that field

Preparing for a Career in the Computer Industry

- Three broad disciplines in higher education that produce the majority of entry-level employees in the computer industry

<table>
<thead>
<tr>
<th>Title</th>
<th>Employment 1998</th>
<th>Employment 2008</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems analyst</td>
<td>413,000</td>
<td>1,196,000</td>
<td>783%</td>
</tr>
<tr>
<td>Database administrator</td>
<td>87,000</td>
<td>136,000</td>
<td>80%</td>
</tr>
<tr>
<td>Front-end software specialist</td>
<td>26,000</td>
<td>44,000</td>
<td>70%</td>
</tr>
<tr>
<td>Computer support specialist</td>
<td>99,000</td>
<td>629,000</td>
<td>630%</td>
</tr>
<tr>
<td>Computer engineer</td>
<td>599,000</td>
<td>333,000</td>
<td>-44%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Computer Information Systems</th>
<th>Computer Science/Software Engineering</th>
<th>Computer Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical and application oriented</td>
<td>Theoretical oriented</td>
<td>Design oriented</td>
</tr>
<tr>
<td>Business and management oriented</td>
<td>Mathematics and science oriented</td>
<td>Mathematics and science oriented</td>
</tr>
<tr>
<td>Understanding how to design and implement information systems</td>
<td>Understanding the fundamental nature of software</td>
<td>Understanding the fundamental nature of hardware</td>
</tr>
<tr>
<td>Degrees include A.A.S., B.S., M.S., Ph.D.</td>
<td>Degrees include B.S., M.S., Ph.D.</td>
<td>Degrees include B.S., M.S., Ph.D.</td>
</tr>
</tbody>
</table>
Articulation agreement

- Ensures that courses taken at one institution will transfer to another

- Many local community colleges offer A.A.S. or A.S. degree
- Students often transfer to four-year college or university to complete B.S. degree
- Individuals with advanced degrees in specific fields have better chance of success
- Many computer degree graduates round out their education by obtaining a Masters in Business Administration (M.B.A.) degree

Trade school

- Offers programs primarily in the areas of programming and maintenance
- Students can complete trade school programs in a shorter time than college or university programs

How can you plan for career development?

- Professional organizations
- Certification
- Continuing education activities
- Web
- Publications

Some organizations for computer professionals

- Association for Computing Machinery (ACM)
- Science-oriented
- Association of Information Technology Professionals (AITP)
- Application-oriented
Some professional organizations

<table>
<thead>
<tr>
<th>Organization</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Organizations</td>
<td></td>
</tr>
<tr>
<td>Association for Computing Machinery</td>
<td>acm.org</td>
</tr>
<tr>
<td>Association for Information Systems</td>
<td>aisist.org</td>
</tr>
<tr>
<td>Association of Information Technology Professionals (OITPMA)</td>
<td>aitp.org</td>
</tr>
<tr>
<td>IEEE Computer Society</td>
<td>compsoc.org</td>
</tr>
<tr>
<td>Institute of Electrical and Electronics Engineers</td>
<td>ieee.org</td>
</tr>
</tbody>
</table>

User group

Collection of people with common computer equipment or software interests

<table>
<thead>
<tr>
<th>Organization</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Apple User Groups</td>
<td>apple.com/au/groups/program</td>
</tr>
<tr>
<td>Association of Professional Computer User Groups (APCUG)</td>
<td>apcug.org</td>
</tr>
<tr>
<td>Microsoft Mindsshare User Group Support Program</td>
<td>microsoft.com/mindsshare/default.asp</td>
</tr>
<tr>
<td>User Group Relations</td>
<td>igr.com</td>
</tr>
</tbody>
</table>

Some professional growth and continuing education

- Workshops
- Seminars
- Conferences
- Trade shows
- Books
- Video-based training
- Computer-based training (CBT)
- Web-based training (WBT)
- Instructor-led training
- Events
- Training

Some Web news sites

<table>
<thead>
<tr>
<th>Website</th>
<th>URL</th>
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<tbody>
<tr>
<td>Publications and Web News</td>
<td></td>
</tr>
<tr>
<td>Computerworld</td>
<td>computerworld.com</td>
</tr>
<tr>
<td>InfoWorld</td>
<td>infoworld.com</td>
</tr>
<tr>
<td>EarthWeb</td>
<td>earthweb.com</td>
</tr>
<tr>
<td>Internet.com</td>
<td>internet.com</td>
</tr>
<tr>
<td>ZDNet Tech Updates</td>
<td>zdnet.com/week</td>
</tr>
</tbody>
</table>
What is computer certification?

- Method for employers to ensure level of competency, skills, or quality in a particular area

How are certifications classified?

- Software applications
- Operating systems
- Programming
- Hardware
- Networking
- Internet
- Database systems

Software applications certifications

<table>
<thead>
<tr>
<th>Certifications</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe Systems Inc.</td>
<td>partners.adobe.com/acctraining</td>
</tr>
<tr>
<td>Autodesk, Inc.</td>
<td>autodesk.com/exams</td>
</tr>
<tr>
<td>Lotus</td>
<td>ibm.com/education</td>
</tr>
<tr>
<td>Microsoft</td>
<td>microsoft.com/training</td>
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</table>

Operating systems certifications

<table>
<thead>
<tr>
<th>Certifications</th>
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<tbody>
<tr>
<td>IBM</td>
<td>ibm.com/training</td>
</tr>
<tr>
<td>Microsoft</td>
<td>microsoft.com/training</td>
</tr>
<tr>
<td>Red Hat</td>
<td>redhat.com/training</td>
</tr>
<tr>
<td>Sun Microsystems</td>
<td>sun.com/training</td>
</tr>
<tr>
<td>Certified System Administrator</td>
<td>sun.com/training</td>
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</table>
### Programming certifications

<table>
<thead>
<tr>
<th>Sponsor and Certifications</th>
<th>URL</th>
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</thead>
<tbody>
<tr>
<td>IBM</td>
<td>ibm.com/certify/index.stmx</td>
</tr>
<tr>
<td>IBM Certified Developer Associate</td>
<td></td>
</tr>
<tr>
<td>IBM Certified Specialist</td>
<td></td>
</tr>
<tr>
<td>Microsoft</td>
<td>microsoft.com/traincert</td>
</tr>
<tr>
<td>Microsoft Certified Solution Developer (MCSD)</td>
<td></td>
</tr>
<tr>
<td>Windows 2000 MCSE</td>
<td></td>
</tr>
<tr>
<td>Sun</td>
<td>sun.com</td>
</tr>
<tr>
<td>Certified Java Programmer</td>
<td></td>
</tr>
<tr>
<td>Certified Java Developer</td>
<td></td>
</tr>
<tr>
<td>Sun Certified Architect for Java Technology</td>
<td></td>
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</table>

### Hardware certifications

<table>
<thead>
<tr>
<th>Sponsor and Certifications</th>
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<tbody>
<tr>
<td>Competing Technology Industry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>comptia.com/certification</td>
</tr>
<tr>
<td>International Business Machines (IBM)</td>
<td></td>
</tr>
<tr>
<td>IBM Certified Professional Server Specialists (FSS)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ibm.com/certify/index.stmx</td>
</tr>
<tr>
<td>National Association of Communication System Engineers (NACSE)</td>
<td></td>
</tr>
<tr>
<td>IACSE Network Technician (IVT)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="http://www.nacse.com">www.nacse.com</a></td>
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### Networking certifications

<table>
<thead>
<tr>
<th>Certifications</th>
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</thead>
<tbody>
<tr>
<td>Cisco</td>
<td>cisco.com/warp/public/Networking/ceitprog</td>
</tr>
<tr>
<td>Cisco Certified Network Professional (CCNP)</td>
<td></td>
</tr>
<tr>
<td>Cisco Certified Internetwork Expert (CCIE)</td>
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</tr>
<tr>
<td>Competing Technology Industry</td>
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</tr>
<tr>
<td>Computing Technology Industry</td>
<td></td>
</tr>
<tr>
<td>Network +</td>
<td>comptia.com</td>
</tr>
<tr>
<td>Microsoft</td>
<td>microsoft.com/traincert</td>
</tr>
<tr>
<td>Microsoft Certified Systems Engineer (MCSE)</td>
<td></td>
</tr>
<tr>
<td>Novell</td>
<td>education.novell.com</td>
</tr>
<tr>
<td>Certified Novell Administrator (CNA)</td>
<td></td>
</tr>
<tr>
<td>Certified Novell Engineer (CNE)</td>
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### Internet certifications

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<tr>
<td>Cisco</td>
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<tr>
<td>Cisco Certified Internetwork Expert (CCIE)</td>
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</tr>
<tr>
<td>International Women's Association  Certified IT Professional (CNP)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>info.org</td>
</tr>
<tr>
<td>Microsoft</td>
<td>microsoft.com/itpert</td>
</tr>
<tr>
<td>Novell</td>
<td>education.novell.com</td>
</tr>
<tr>
<td>Novell Certified Internet Professional</td>
<td></td>
</tr>
<tr>
<td>ProsoftTraining</td>
<td>prosoft.com</td>
</tr>
<tr>
<td>Certified Internet Webmaster (CNIW)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>uncertified.com</td>
</tr>
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### Database systems certifications

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<tr>
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<th>UPI</th>
</tr>
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<tbody>
<tr>
<td>IBM - IBM Certified Solutions Expert DB2, LEBR 6.1, IBM Database Administration for DB2, Windows, and O/S 2</td>
<td>ibm.com/certify/index.html</td>
</tr>
<tr>
<td>Informix - Informix Certified Database Specialist</td>
<td><a href="http://www.informix.com/informix/training/courses/certif">www.informix.com/informix/training/courses/certif</a></td>
</tr>
<tr>
<td>Microsoft - Microsoft Certified Database Administrator (MCDBA)</td>
<td>microsoft.com/trainingportal</td>
</tr>
<tr>
<td>Oracle - Oracle Certified Database Administrator (OCDBA), Oracle Certified Professional (OCP)</td>
<td>oracle.com/education/certification</td>
</tr>
<tr>
<td>Sybase - Sybase Certified Professional (SCP)</td>
<td>sybase.com/education/certif</td>
</tr>
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</table>

### Primary benefit of certification

- Enhances careers; provides a better salary and a better standing as industry professionals

### Factors to consider in choosing a certification

- Reflect on your career goals and interests
- Consider your long-term career path
- Assess your background and experience
- Research certifications

- Consider the expenses and the time involved to obtain the certification.
- Examine employment projections.
- Look at job listings to see what skills are currently required.
- Read evaluations of certifications.
- Talk to people in the industry.
- Think about complementary certifications to meet your goals.

### What options are available to prepare for certification?

- Most certification programs do not require academic coursework

- **Self-study**
- **Online training classes**
- **Instructor-led training**
- **Web resources**
What are examinations like?

- Examinations, usually multiple choice, are taken using computers
- Some required projects or written test.

References

- Computers in Your Future (Ch. 12)
- Discovering Computers World 2003 (Ch. 4 – 7, 16)