

The Computer System

- Hardware = Physical components of computer system
- Software = Set of instructions that control execution of a computer and includes data
- Computer Literacy: Use the power of the computer for specific purpose

Copyright © 2019 R. Laurie 1

Digital Computer = Binary Processor

- ❖ Computer data is represented and using the **binary system** = Base 2
- ❖ Each digit in binary is called a **bit**
 - ◆ A bit value can be in one of two states
 - ◆ Represented by 0/1, T/F, On/Off.
- ❖ A group of 8 bits is called a **byte**
- ❖ Characters are represented using **ASCII** Code with one byte/character

◆ 'A' = 0100,0001	0	1	0	0	1	0	1	0
◆ '7' = 0011,0111	0	1	0	0	1	0	1	1
◆ 'J' = 0100,1010	0	1	0	0	1	0	1	0

Copyright © 2019 R. Laurie 2

Computer Literacy

- ❖ What is **computer literacy**?
 - ◆ Knowledge of computers and their uses
 - ◆ Developing **End User Skills** is goal of IFSM201
- ❖ Why are computers **important for success**?
 - ◆ Required employment skill
 - ◆ Computers deliver information
 - ◆ Important for making good decisions
- ❖ What is a **computer**?
 - ◆ Electronic device operating under the control of instructions stored in its own memory
 - ◆ Accepts **data input**: raw facts, figures, and symbols
 - ◆ Processes data into **information output** that is meaningful for people
 - ◆ Produces and stores results for later retrieval
 - ◆ Semiconductor electronics is fastest technology

Copyright © 2019 R. Laurie 3

Components of the System Unit

- ❖ 5 major components of computer systems
- ❖ This section focuses on the CPU, Memory, Expansion, drive bays, and power supplies

System Unit (Desktop Computer)

Copyright © 2019 R. Laurie 4

Computer Hardware Components

- ❖ **Processor = Central Processing Unit (CPU)**
 - ◆ The electronic component that interprets and executes the program instructions in the computer
 - ❖ **Memory = RAM, Cache, CPU Registers**
 - ◆ Memory is fast and temporarily stores instructions and data
 - ◆ **Volatile** = Data loss when power off
 - ❖ **Storage = Hard Drive, CD, DVD, Flash Memory Device**
 - ◆ Storage is slower, but permanent stores instructions and data
 - ◆ **Non-Volatile** = Retains data when power off
 - ◆ **Storage device**
 - ◆ Records and retrieves items on storage media
 - ◆ **Storage media**
 - ◆ Physical material on which data and instructions are stored
 - ❖ **Network**
 - ◆ **Communications device** that enables computer to send and receive data and instructions to another device via media
 - ◆ **Transmission media** may include cables, telephone lines, cellular radio networks, and satellites

Copyright © 2019 R. Laurie | 5



Multi-User Computers

- ❖ These computers are shared by many users
 - ◆ Servers control access to network resources and provides centralized storage
 - ◆ Web Servers serve web applications and web pages for World Wide Web using Internet
 - ◆ Mainframe Powerful, expensive computer that supports thousands of connected users
 - ◆ Supercomputer Fastest, most powerful, most expensive computer used for applications requiring complex mathematics

Copyright © 2019 R. Laurie

Categories: Personal Computers

- ❖ **Desktop computer** = Designed so all of the components fit entirely on or under a desk or table



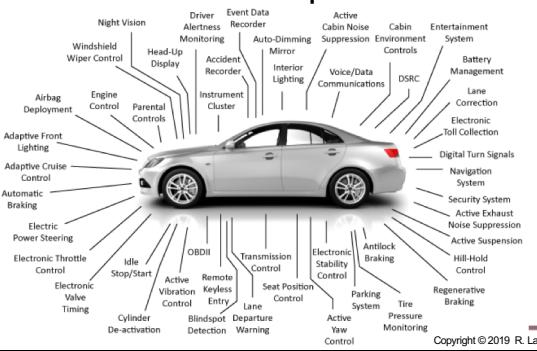
- ❖ **Mobile Computing**
 - ◆ Notebook = Laptops
 - ◆ Tablets = iPad, Kindle
 - ◆ Smart Phones
 - ◆ iPhone = Apple
 - ◆ Android = Google



Copyright © 2019 R. Laurie

Embedded Computers

- ❖ An **embedded computer** is a special-purpose computer that functions as a component in a product
 - ❖ No or little human interaction required



Copyright © 2019 R. Laurie

Memory Size and Speed

- ❖ Storage and memory capacity is expressed in the **number of bytes**
 - ◆ **1 KiloByte = 2^{10}** or 1024 bytes
 - ◆ **1 MegaByte = 2^{20}** or 1,048,576 bytes
 - ◆ **1 GigaByte = 2^{30}** or 1,073,741,824 bytes
 - ◆ **1 TeraByte = 2^{40}** or 1,099,511,627,776 bytes

Bus speeds

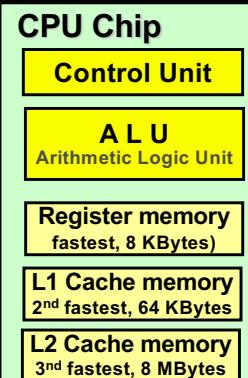
- ◆ **1 KiloHertz = 10^3** or 1 milliSecond
- ◆ **1 MegaHertz = 10^6** or 1 microSecond
- ◆ **1 GigaHertz = 10^9** or 1 nanoSecond

Copyright © 2019 R. Laurie

9

The Central Processor Unit (CPU)

- ❖ The CPU contains 5 major functional components on one silicon chip
 - ◆ Control unit
 - ◆ Arithmetic/logic unit (ALU)
 - ◆ Register memory
 - ◆ L1 Cache memory
 - ◆ L2 Cache memory
- ❖ Microprocessor is a CPU
- ❖ CPU interacts closely with memory through 3 buses

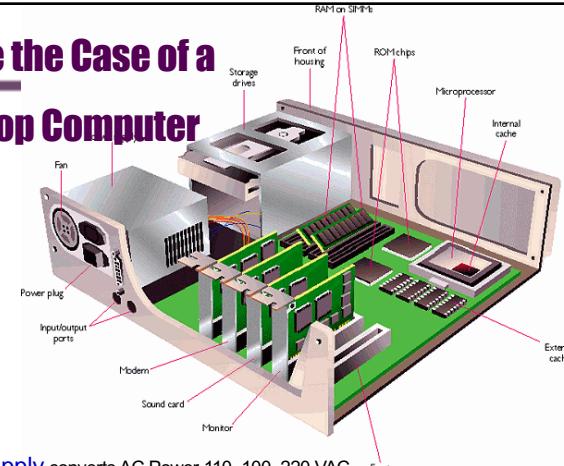


Copyright © 2019 R. Laurie

11

Inside the Case of a

Desktop Computer



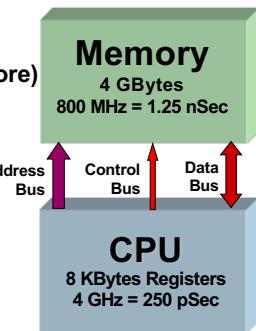
Power supply converts AC Power 110, 100, 220 VAC into DC Electric Power 3.3, 5, and ±12 VDC

Copyright © 2019 R. Laurie

10

Central Processor Unit and Memory

- ❖ **CPU**
 - ◆ Register memory (fastest)
 - ◆ Cache memory (slower but more)
- ❖ **RAM Memory**
 - ◆ Random-access memory
 - ◆ **Volatile** memory
 - ◆ Stores program instructions and data
- ❖ **Parallel Processing**
 - ◆ Single-core processors
 - ◆ Dual-core processors
 - ◆ Quad-core processors
- ❖ **Speed** CPU → Cache → RAM → SSD → HD



Copyright © 2019 R. Laurie

12

What is Storage?

- ❖ Holds data, instructions, and information for future use
- ❖ Also called secondary storage or auxiliary storage
- ❖ Storage medium is physical material used for storage

Copyright © 2019 R. Laurie 13

Storage Sizes

- ❖ What is capacity?
 - ◆ Number of bytes (characters) a storage medium can hold

Kilobyte (KB)	1 thousand	2^{10} or 1024 bytes
Megabyte (MB)	1 million	2^{20} or 1,048,576 bytes
Gigabyte (GB)	1 billion	2^{30} or 1,073,741,824 bytes
Terabyte (TB)	1 trillion	2^{40}
Petabyte (PB)	1 quadrillion	2^{50}
Exabyte (EB)	1 quintillion	2^{60}
Zettabyte (ZB)	1 sextillion	2^{70}
Yottabyte (YB)	1 septillion	2^{80}

Copyright © 2019 R. Laurie 14

Longevity of Digital Storage Media

The physical media on which it is stored has a **limited physical lifetime**

	Magnetic tape <i>Sequential Access</i>	1 yr.
	Videotape <i>Sequential Access</i>	1–2 yrs.
	Magnetic disk <i>Random Access</i>	3–5 yrs.
	Optical disk <i>Random Access</i>	30 yrs.
	Microfilm <i>Sequential Access</i>	300 yrs.

Copyright © 2019 R. Laurie 15

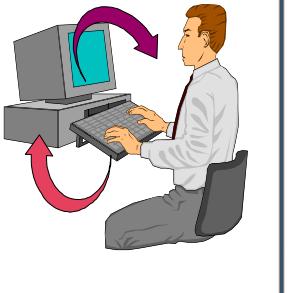
Optical Disc Storage Capacities

- ❖ CD-ROM, CD-R, CD-R/W
 - ◆ 700 MB per side
- ❖ DVD
 - ◆ 4.7 GB or 4700 MB: single side, single layer
 - ◆ 8.5 GB: single side, double layer
 - ◆ 17 GB: double side, double layer
- ❖ Blu-Ray or BD-ROM
 - ◆ 25 GB: single side, single layer
 - ◆ 50 GB: single side, double layer
 - ◆ 100 GB: double side, double layer
- ❖ Record and R/W
 - ◆ DVD Record has several formats

Copyright © 2019 R. Laurie 16

Computer Input and Output

- ❖ It is from the computers perspective that Input/Output devices are defined
- ❖ Input data using input devices such as keyboard or mouse
- ❖ Output information that is the result of processing data to output devices like a monitor and printer



Copyright © 2019 R. Laurie 17

Input Peripheral Devices

Copyright © 2019 R. Laurie 18

Output Peripheral Devices

Dot Matrix Printer			

Copyright © 2019 R. Laurie 19

Peripheral Devices Connect via Ports

1. Video Port = connects monitor
2. Keyboard/Mouse Port = PS/2 Port
3. Serial Port = 9 or 25 pins, mouse, modem
4. Parallel Port = 25 holes, LPT1, LPT2
5. Game Port = joystick
6. **USB Ports = Universal Serial Bus**
7. Fire Wire Port = High Speed Port
8. Audio In Port = Microphone
9. Audio Out Port = Speakers
10. MIDI (Musical Instrument Digital Interface) port
11. eSATA port
12. SCSI port
13. IrDA (Infrared Data Association) port
14. Bluetooth port
15. **HDMI port (High-Definition Multimedia Interface)**
16. **DVI port (Digital Video Interface)**



Copyright © 2019 R. Laurie 20

Networks and the Internet

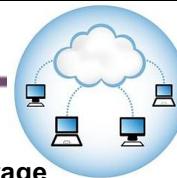
- ❖ A **network** is a collection of computers and devices connected together via communications devices and transmission media
- ❖ The **Internet** is a worldwide collection of networks that connects millions of businesses, government agencies, educational institutions, and individuals



Copyright © 2019 R. Laurie 21

Cloud Storage

- ❖ Cloud storage refers to the creation and use of remote servers over Internet for data storage
- ❖ Can share files across multiple Devices
 - ◆ Free Services: Dropbox, Google Drive, iCloud, Microsoft OneDrive, SpiderOak (secure), iDrive
 - ◆ Advantage: Good for data backup and file sharing
 - ◆ Disadvantages: Requires Internet and security risk
- ❖ **SAAS = Software As A Service**
 - ◆ Utilizes browser for UI user interface
 - ◆ Utilizes cloud storage for storing files
 - ◆ Office SAAS: Zoho, Google Docs, and Office 365



Copyright © 2019 R. Laurie 22

Word Processing

- ❖ Typewriters become obsolete
- ❖ Word processing lets you:
 - ◆ Create document
 - ◆ Edit document
 - ◆ Format document
 - ◆ Store document
 - ◆ Retrieve document
 - ◆ Print document



Copyright © 2019 R. Laurie 23

Edit and Format Document

- ❖ Edit document
 - ◆ Editing a text document means to make changes to the contents of the document
 - ◆ Insertions or deletions to fix errors, improve its content, or move text
 - ◆ Powerful replace and replace all occurrences functions available
- ❖ Format document
 - ◆ Formatting refers to modifying the appearance of the text document
 - ◆ Does not alter content—only look of the document
 - ◆ Includes alignment, fonts, line spacing, and more

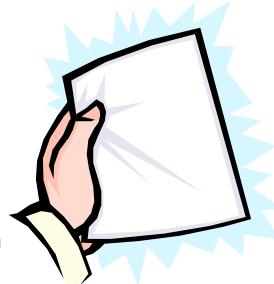


Copyright © 2019 R. Laurie 24

Word Processing Basics

- ❖ Think of the computer screen as a page of typing paper with these differences:

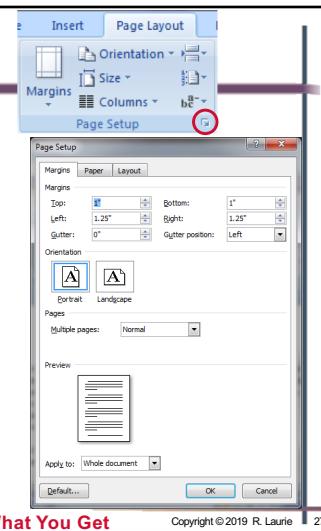
- ◆ Cursor
 - ◆ Scrolling
 - ◆ Word wrap
 - ◆ Character insertions
 - ◆ Character deletions
- ❖ Command Access
 - ◆ Pull Down Menus
 - ◆ Toolbar Buttons
 - ◆ Microsoft Office Ribbon
 - ◆ Shortcut keys
 - ◆ Context Sensitive Menu



Copyright © 2019 R. Laurie 25

Page Layout

- ❖ Margins adjust
 - ◆ Top, Bottom, Left, Right
- ❖ Orientation
 - ◆ Portrait
 - ◆ Landscape
- ❖ Pagination
 - ◆ Page Breaks
 - ◆ Header Layout
 - ◆ Footer Layout
- ❖ View Menu
 - ◆ Normal
 - ◆ Web Layout
 - ◆ Print Layout



WYSIWYG = What You See Is What You Get

Copyright © 2019 R. Laurie 27

Navigation and Word Wrap

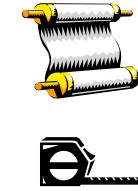
❖ Cursor

- ◆ Cursor shows where next character will appear in your document

◆ Move Cursor

- ◆ Use mouse or other pointing device
- ◆ Use keyboard arrow keys

I



Copyright © 2019 R. Laurie 26

❖ Scrolling

- ◆ Scrolling is necessary to see portions of a document that can't fit on screen at one time

❖ Word Wrap

- ◆ Words that won't fit on a line are automatically moved down at the beginning of the next line

Edit Commands

❖ Edit Menu commands change text content

- ◆ Undo Ctrl-Z
- ◆ Redo Ctrl-Y
- ◆ Cut Ctrl-X
- ◆ Copy Ctrl-C
- ◆ Paste Ctrl-V
- ◆ Paste Special...

Short Cut Keys

Underlined letters are Alt-key selections used if mouse not available

Toolbar Buttons or Ribbon



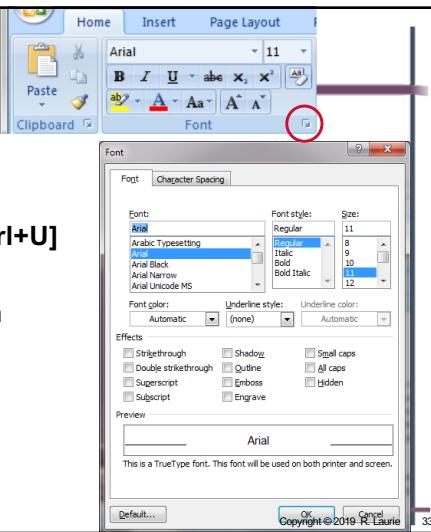
❖ Clipboards

- ◆ Windows = Paste between any application
 - ◆ Holds only 1 item, but pasted multiple times
- ◆ Office = Paste between office applications
 - ◆ Holds 24 items and each can be pasted multiple times
 - ◆ Available as a Task Pane Ctrl-F1 in Office 2003
 - ◆ Available in Ribbon in Office 2007

Font Style

❖ Font Style

- ◆ **Bold** [Ctrl+B]
- ◆ **Italics** [Ctrl+I]
- ◆ **Underline** [Ctrl+U]
- ◆ **Shadow**
- ◆ **Strikethrough**
- ◆ **Superscript**
- ◆ **Subscript**
- ◆ **SMALL CAPS**



Word Processing Tools

❖ Spell checking

- ◆ Spelling checkers are a preliminary proofreading devices
- ◆ They lack scope or intuitive power of a human proofreader



❖ Grammar checking

- ◆ Grammar checkers will find errors in verb tense, point out active vs. passive voice, and a host of other grammatical rules that the user may have broken
- ◆ Not always accurate so use as a writing advisor

❖ Thesaurus

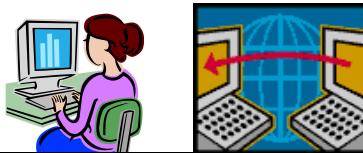
- ◆ Find words with similar meaning
- ◆ Find **Ctrl f** and Replace **Ctrl h**

Copyright © 2019 R. Laurie 34

Clip Art

❖ Clip art is **ready-to-use** art than can enhance the text design

- ◆ Cartoon style images with relatively few colors, improves compressibility (file size)
- ◆ Accessed in Task Pane or Drawing toolbar
- ◆ Menu command Insert | Picture | Clip Art
- ◆ Create your own using a painting program



Copyright © 2019 R. Laurie 35

Bullet and Number Lists

❖ Organizes information by topic

- ◆ **Bullet List** emphasizes and separates items
 - ◆ Can use different styles of bullets
 - ◆ Can be used to create leveled Hierarchy
- ◆ **Number List** sequences or prioritizes items
 - ◆ Updated automatically with insert or delete
 - ◆ Outlines use Number List Leveled Hierarchy
 - ◆ Examples

► 1	2	3	4	5	6
► i	ii	iii	iv	v	vi
► A	B	C	D	E	F
► a	b	c	d	e	f

Copyright © 2019 R. Laurie 36

Outlines

- ❖ Helps to organize thoughts
 - ◆ Leveled Hierarchy
 - ◆ Topic Independence
 - ◆ Sub-Topic Dependence
- ❖ First step when writing a college paper
- ❖ Good for organizing shopping lists

Shopping for a Computer

- I. Hardware
 - A. CPU
 - B. RAM
 - C. Hard Drive
- II. Software
 - A. OS
 - B. Applications
 - 1. Office
 - a. Word Processing
 - b. Spreadsheets
 - 2. Finances
 - III. Warranty and Service

Copyright © 2019 R. Laurie 37

Tables

- ❖ Organizes Information
 - ◆ 2 dimensional grid
 - ◆ Rows, Columns, Cells
- ❖ Provides 2-D Layout Capability
 - ◆ Can put anything in a cell
 - ◆ Text, Numbers, Photos, Clip Art
- ❖ Table | Insert | Table command
 - ◆ Insert Rows, Columns, Cells
 - ◆ Delete Rows, Columns, Cells
 - ◆ Merge Cells, Split Cells
 - ◆ AutoFormat
 - ◆ Auto Fit
 - ◆ Gridlines

Insert Table

Table size
Number of columns: 5
Number of rows: 2
AutoFit behavior
 Fixed column width:
 AutoFit to contents
 AutoFit to window
Table style: Table Grid [AutoFormat...](#)

Remember dimensions for new tables

OK Cancel

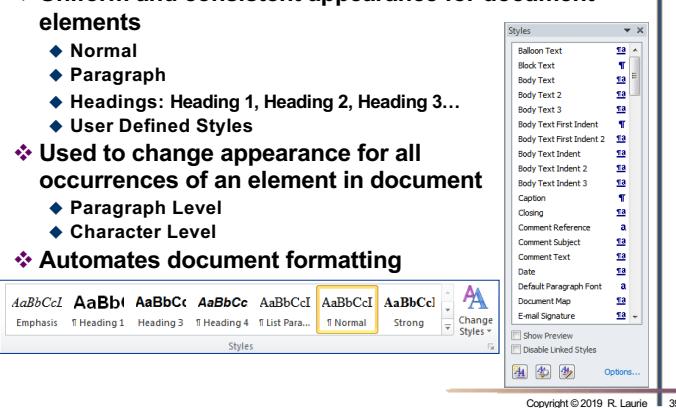


Copyright © 2019 R. Laurie 38

Styles

- ❖ Uniform and consistent appearance for document elements
 - ◆ Normal
 - ◆ Paragraph
 - ◆ Headings: Heading 1, Heading 2, Heading 3...
 - ◆ User Defined Styles
- ❖ Used to change appearance for all occurrences of an element in document
 - ◆ Paragraph Level
 - ◆ Character Level
- ❖ Automates document formatting

Styles



Copyright © 2019 R. Laurie 39