**CSIS 2200:**

**Slide 01: Information System an Overview**

**Computer literacy:**

Skill in using productivity software, as well as having a basic knowledge of hardware and software, the internet, and collaboration tools and technologies.

**Information Literacy:**

Understanding the role of information in generating and using business intelligence (BI). Provides historical, current and predictive views of business operations and environments and gives organizations a competitive advantage in the marketplace.

**Transaction-Processing Systems (TPS):**

* Focus on data collection and processing.
* Used for cost reduction.
* Applied to structured task.
* Require minimal human involvement when automated.

**Management Information System (MIS):**

* Organized integration of hardware and software technologies, data, processes, and human elements.
* Designed to produced timely, integrated, relevant, accurate, and useful information for decision-making.
* Designing tasks
  + Define the system’s objectives
  + Collect and analyze data
  + Provide information in a useful format for decision-making purposes.
* MIS applications
  + Used in both private and public sectors.

**Components of an Information System:**

*Data | Database | Process | Information*

1. Data:
   1. Considered the input of a system.
   2. Sources of data:
      1. Internal: records.
      2. External: customers, suppliers, government agencies, labor…
   3. Has a time orientation:
      1. Past data: performance reports.
      2. Current data: operational reports.
   4. Can be collected in different forms:
      1. Disaggregated data: helps analyze sales by product, territory, or salesperson.
      2. Aggregated data: useful for reporting overall performance during a sales quarter.
2. Database:
   1. Collection of relevant data organized in a series of integrated files.
      1. Essential for the success of any information system.
   2. Database management System (DBMS)
      1. Used to create, organize, and manage databases
      2. Reduces personnel time needed to gather, process, and interpret data manually.
3. Process:
   1. Generates the most useful type of information for making decisions
      1. Transaction-processing reports.
      2. Models for decision analysis that can be built into the system or accessed from external sources.
4. Information:
   1. Consists of facts analyzed by the process component and is an output of an information system.
      1. Usefulness qualities
         1. Timelines
         2. Integration with other data and information
         3. Consistency and accuracy
         4. Relevance
   2. Needs to provide either a base for users to explore different options or insight into tasks.
   3. Usefulness is affected by the information system’s user interface.
      1. Graphical user interfaces (GUIs) are used because they are flexible and easy.
   4. Systems should produce information in different formats, including graphics, tables and exception reports.
      1. Increases likelihood of users understanding and being able to use the information.
   5. Users need to be able to make use of informal information when solving problems.

**Information technologies:**

* The internet.
* Computer networks.
* Database systems.
* Point-of-sale (POS) systems.
* Radio-frequency-identification (RFID)

**Importance of Information Systems:**

* Timely, relevant, and accurate information is a critical tool.
  + Enhance competitive position in the marketplace.
* Manage the four Ms of resources:
  + Manpower
  + Machinery
  + Materials
  + Money
* Personal Information System (PIS) or Human Resource Information System (HRIS)
  + Designed to provide information that helps decision makers in personnel carry out tasks effectively.
* Logistic Information System (LIS)
  + Designed to reduce the cost of transporting materials while maintaining safe and reliable delivery.
* Manufacturing information system (MIS)
  + Used to manage manufacturing resources.
  + Reduce manufacturing costs.
  + Increase product quality.
  + Improve inventory decisions.
* Financial information system (FIS)
  + Used to provide information to financial executives in a timely manner.
* Marketing information system (MKIS)
  + Used to improve marketing decisions.
  + Provides timely, accurate, and integrated information about the marketing mix.
  + Price, promotion, place and product.
* Marketing technology tools
  + Business, web, and mobile analytics
  + E-mail marketing
  + Search engine marketing
  + Mobile technologies
  + Marketing automation

**Using Information Technologies for a Competitive Advantage:**

* Michael Porter: Three strategies for successfully competing in the marketplace.
  + Overall cost leadership.
  + Differentiation.
  + Focus.
* Information systems
  + Help organizations reduce the cost of products and services.
  + Help bottom-line and top-line strategies.
  + Use enterprise systems to create an efficient and effective link between suppliers and consumers.
* Differentiation strategies
  + Making products and services different from competitors.
* Focus strategies
  + Focusing on specific market segments to achieve a cost or differentiation advantage.

**Porter’s Five Forces Model: Understanding the Business Environment**

* Analyzes a firm’s position in the marketplace and how information systems can make it more competitive.
  + Five forces
    - Buyer power.
      * **High** when customers have **many** choices.
      * **Low** when customers have **few** choices.
    - Supplier power.
      * **High** when customers have **fewer** options
      * **Low** when customers have **more** options
    - Threat of substitute products or services.
      * **High** when **many alternatives** to an organization’s products and services are available.
    - Threat of new entrants.
      * **Low** when duplicating a company’s product or service is difficult.
      * **Focus** strategies are used to ensure that the threat remains low.
    - Rivalry among existing competitors.
      * **High** when competitors occupy the same marketplace position.
      * **Low** when there are few competitors.

This image depicts the five forces model. There is rectangular box positioned at the center of the image, and four boxes have been positioned around this box. The box on the left is labeled suppliers, the box on the right is labeled buyers, the box at the top is labeled potential entrants, and the box at the bottom is labeled substitutes.  
The box at the center contains two points that read industry competitors and rivalry among existing competitors. A U-shaped arrow has been positioned between these points. The arrowhead points at the first point. 
An arrow arises from the right side of the box labeled suppliers that is positioned on the left and points at the box at the center of the image. This arrow is labeled bargaining power of suppliers. 
An arrow arises from the left side of the box labeled buyers that is positioned on the right and points at the box at the center of the image. This arrow is labeled bargaining power of buyers. 
An arrow arises from the bottom of the box labeled potential errants that is positioned at the top and points at the box at the center of the image. This arrow is labeled threats of new entrants. 
An arrow arises from the top of the box labeled substitutes that is positioned at the bottom and points at the box at the center of the image. This arrow is labeled threat of substitute products or services.  

**The IT Job Market**

* Operations and help desk.
* Programming.
* Systems design.
* Web design and web hosting.
* Network design and maintenance.
* Database design and maintenance.
* Robotics and artificial intelligence.
* Chief of Technology Officer (CTO) / Chief of Information Officer (CIO)
  + Oversees long-range planning and monitors new developments that can affects a company’s success.
* Chief Privacy Officer (CPO)
  + Responsible for managing risks and business impacts of privacy laws and policies.
* Manager of information systems services
  + Responsible for managing hardware, software, and personnel in the information systems department.
* Systems analyst
  + Responsible for the design and implementation of information systems.
  + Should have a sound understanding of business systems and functional areas within a business organization.
* Network administrator
  + Oversees a company’s internal and external network systems.
  + Provides network and cybersecurity.
* Database administrator (DBA)
  + Responsible for database design and implementation.
  + Required to have knowledge and understanding of data warehouses and data-mining tools.
* Computer programmer
  + Writes programs or software segments that allow the information system to perform a specific task.
* Webmaster
  + Designs and maintain the organization’s web site.
  + Have been in high demand owing to the popularity of e-commerce applications.

**Outlook for the Future**

* Hardware and software costs will decline
* Artificial intelligence and related technologies will improve and expand.
* Computer literacy and networking technology will improve.
* Personal computer will improve in power and quality.
* Internet growth will continue.
* Computer criminals will become more sophisticated.
* Protecting personal information will become more difficult.
* Ubiquitous computing and the Internet of Things (IoT).
* 3D printing, pervasive analytics, context aware computing, smart machines and devices, and cloud computing.
* Software defined applications and infrastructures.
* Security.
* Increased applications of augmented and virtual reality.

Check computer: Core, ram, cache, # of usb port

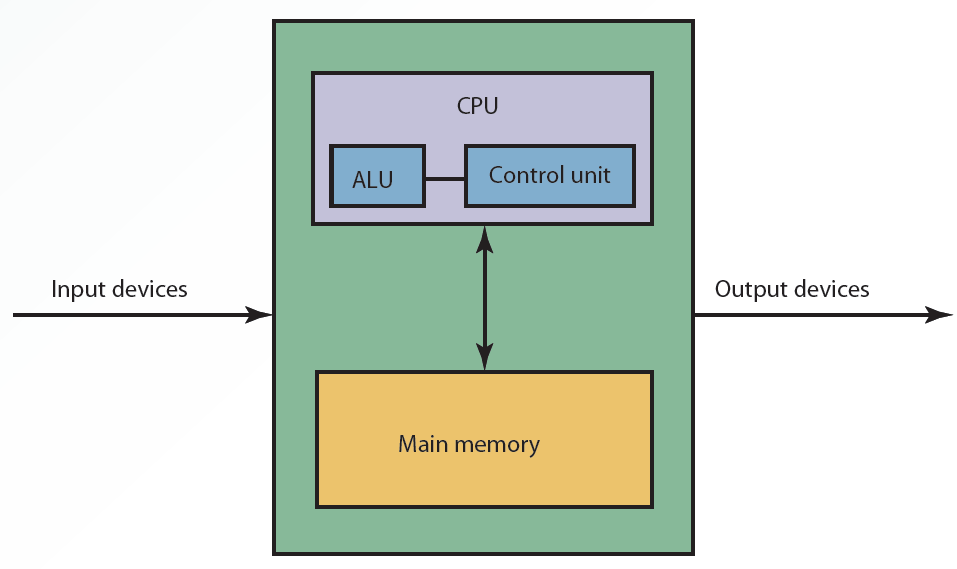
**Slide 02: Computers: The Machines Behind Computing**

**Defining a Computer:**

* A computer is a machine that:
  + Accept data as input.
  + Processes data without human intervention using stored instructions.
  + Outputs information.
* Instructions:
  + Step-by-step directions for performing a specific task.
  + Written in a language the computer can understand.
* Garbage in, garbage out (GIGO):
  + If the input data is erroneous, the information provided by the computer is also erroneous.
* Writing a computer program:
  + Identify what needs to be done.
  + Write the algorithm to achieve the goal.
  + Select a programming language for it. (depends on the problem and the computer)
* A program is also called a source code (a sequence of 0’s and 1’s).

**Components of a Computer System:**

* Hardware: physical devices such as keyboard, monitors, processing units.
* Software: programs written in computer languages.
* Central Processing Unit (CPU): the heart of the computer
  + Arithmetic Logic Unit (ALU): perform the arithmetic operations.
  + Control Unit: tells the computer what to do such as instructing the computer which device to read or send output to.
* Computers can have a single processor or multiple ones (two or more CPUs).



* Bus: link between devices connected to the computer.
  + Parallel or serial.
  + Internal (local) or external.
* Disk drive: peripheral device for recording, storing, and retrieving information.
* CPU case: enclosure containing the computers main components (computer chassis or tower).
* Motherboard: main circuit board containing connectors for attaching additional boards.

**Hardware Generations:**

**Table

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**The Power of Computers:**

* Speed.
  + Measured by the number of instructions executed per fractions of a second:
    - Millisecond: 1/1,000
    - Microsecond: 1/1,000,000
    - Nanosecond: 1/1,000,000,000
    - Picosecond: 1/1,000,000,000,000
* Accuracy.
* Storage and retrieval capabilities.
  + Save data in computer memory.
  + Access data from memory.
  + Data stored in bits.
  + American Standard Code for Information Interchange (ASCII).
    - Defines up to 128 characters.

Table

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**Computer Operations:**

* Computer functions:
  + Three basics tasks:
    - Arithmetic operations.
    - Logical operations.
    - Storage and retrieval operations.
  + Input, Output and Memory
  + Main Memory:
    - Volatile and nonvolatile.
    - Random Access Memory (RAM).
    - Cache RAM: stores recently accessed memory.
      * Resides on the processor.
      * Made of silicon.
    - ROM (Read-only Memory).
      * Nonvolatile memory.
      * Data cannot be written to it.
      * Includes BIOS information and the computer system’s clock.
      * Programable read-only memory (PROM).
      * Erasable Programable read-only memory (EPROM).
  + Secondary Memory:
    - Magnetic disks.
      * Made of Mylar or metal.
      * Used for random-access processing.
    - Magnetic tape:
      * Made of a plastic material.
      * Stores data sequentially.
    - Optical disks:
      * Use lasers beams to access and store data.
      * CD-ROMs, WORM discs, and DVDs.
      * Include hard disks, USB flash drives, and memory cards.
    - Redundant Array of Independent Disks (RAID):
      * Collection of disk drives used for fault tolerance and improved performance.
      * Found in large network systems.
    - Cloud storage:
      * Involves multiple virtual servers that are hosted by third parties.

Table

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* Storage Area Network:
  + Dedicated high-speed network consisting of both hardware and software.
  + Connect and manage shared storage devices
  + Disk arrays, tape libraries, and optical storage devices.
* Network-Attached Storage (NAS)
  + Network-connected computer dedicated to provide file based data storage services to other network devices.

**Classes of Computer:**

* Based on cost, amount of memory, speed and sophistication.
* Subnotebooks and notebooks
* Personal and minicomputers
* Mainframes
* Supercomputers

**Server Platforms: An Overview**

* Server: computer and all the software for managing network resources and offering services to a network.
* Available server platforms: applications servers, database servers, disk servers, fax servers, file servers, mail servers, print servers, remote access servers (RAS), and web servers.

**What is a Software?**

* Programs that run a computer system.
* Classification:
  + System software: work in the background and takes care of tasks, such as deleting waste files.
  + Application software: performs specialized tasks.

**Operating System Software:**

* Set of programs controlling and managing computer hardware and software.
  + Provides an interface between a computer and the user.
  + Increases computer efficiency by helping users share computer resources and performing repetitive tasks for users.
  + Increases computer efficiency by helping users share computer resources and performing repetitive tasks for users.
* Consists of control programs to manage hardware and resources by performing:
  + Job management.
  + Resource allocation.
  + Data management
  + Communication
* Supervisor program (i.e., the Kernel)
  + Responsible for controlling all other programs in th OS.
* Application Software:
  + Commercial software or software developed in house; used t perform variety of tasks on a personal computer.
    - Word processing, spreadsheet, database, presentation and graphics.
    - Desktop publishing.
    - Financial planning and accounting.
    - Computer-aided design (CAD).
* Computer Languages:
  + Machine Language:
    - First generation of computer languages.
    - Consists of a series of 0s and 1s representing data or instructions.
    - Dependent on the machine.
    - Time-consuming to write a program.
  + Assembly language:
    - Second generation of computer languages.
    - Machine dependent and a higher-level language than machine language.
    - Uses a series of short codes, or mnemonics, to represent data or instructions.
  + High-level languages:
    - Third generation of computer languages.
    - Machine independent and self-documenting.
    - Used for web development and internet applications.
  + Fourth-generation languages (4GLs):
    - Commands are powerful and easy to learn.
    - Use macro codes that can take the place of several lines of programming.
  + Fifth-generation languages:
    - Used artificial intelligence technologies.
    - Knowledge-based systems, natural language processing (NLP), visual programming, and a graphical approach to programming.
    - Designed to facilitate natural conversations between an individual and the computer.