

# *IT*

## *(Information Technology)*

*Department of Industrial Engineering  
Sharif University of Technology*

*Session# 3*



### *Course Description (Continued..)*

- *Contents:*
- *The role of managers in Information Technology (IT)* (3 sessions)
- *Organizational Issues* (3 sessions)
- *Information Technology* (9 sessions)
- *Operational and enterprises systems* (4 sessions)
- *Exciting directions in systems* (3 sessions)
- *E-Business and E-Commerce* (3 sessions)
- *Issues for senior management* (2 sessions)

## Course Description (Continued..)

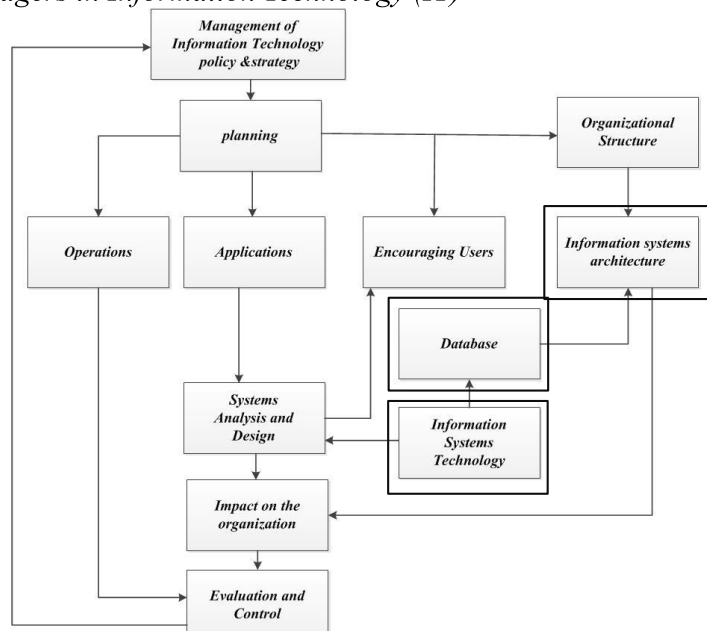
### ▪ Contents:

- *Information Technology* (9 sessions)
  - *Fundamentals*
    - *The components of a personal computer*
  - *Software*
    - *Managerial concerns*
    - *The Contribution of Higher-Level languages*
    - *The Web Browser and Internet standards*
    - *The operating system*
  - *Database management*
    - *File elements*
    - *Enter database management software*
    - *Database in systems design*
    - *Data Warehouses, Data Marts, and Data Centers*
    - *Enterprise Content Management*

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### The role of managers in Information Technology (IT)



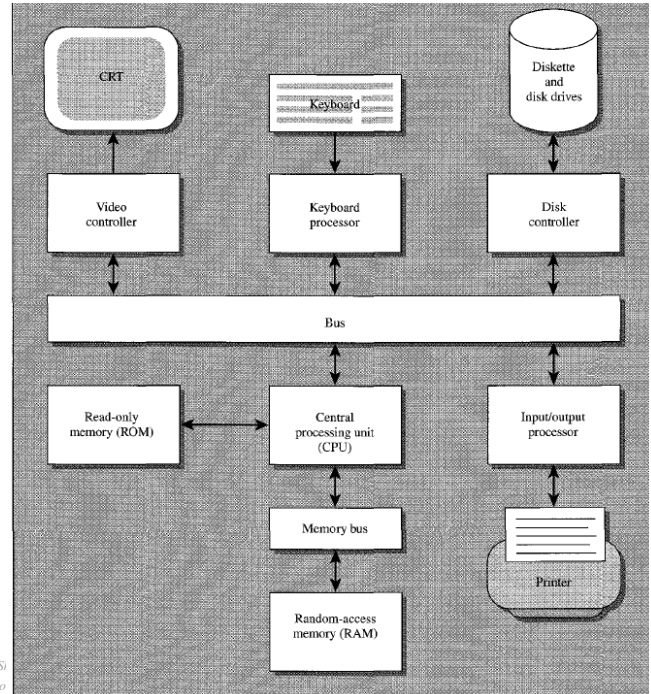
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## Information Technology

### ▪ Fundamentals

- *The components of a personal computer*
  - *The heart of the computer is the central processing unit or CPU, which contains the logic that controls the calculations done by the computer.*
- *The Bus is a communications device, really a connection among various parts of the computer*

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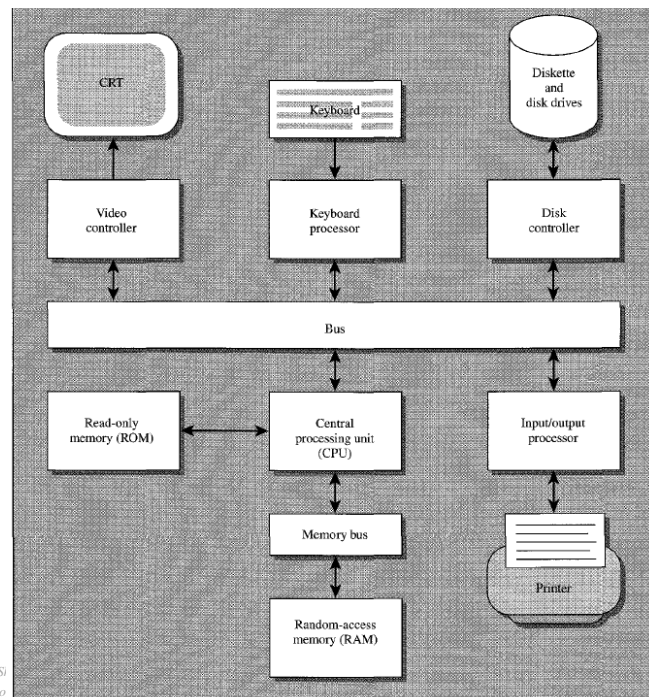


## Information Technology

### ▪ Fundamentals

- *The components of a personal computer*
  - *Primary memory of the computer holds two kinds of information.*
- *We have an input-output (I/O) processor, which is dedicated to controlling devices such as printers*
- *Read-only memory stores instructions used by the computer*

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## Information Technology

### ▪ Fundamentals

#### ▪ CPU

- The control unit manages the CPU
- The Bus interfaces the cache memory on the chip with random access memory chips (RAM).
- The code cache is a portion of very fast memory on the CPU chip.
- The data cache is also fast memory for keeping small amounts of data for faster access than is available from RAM memory chips.
- The instruction location counter always points to the next instruction in a program to be executed

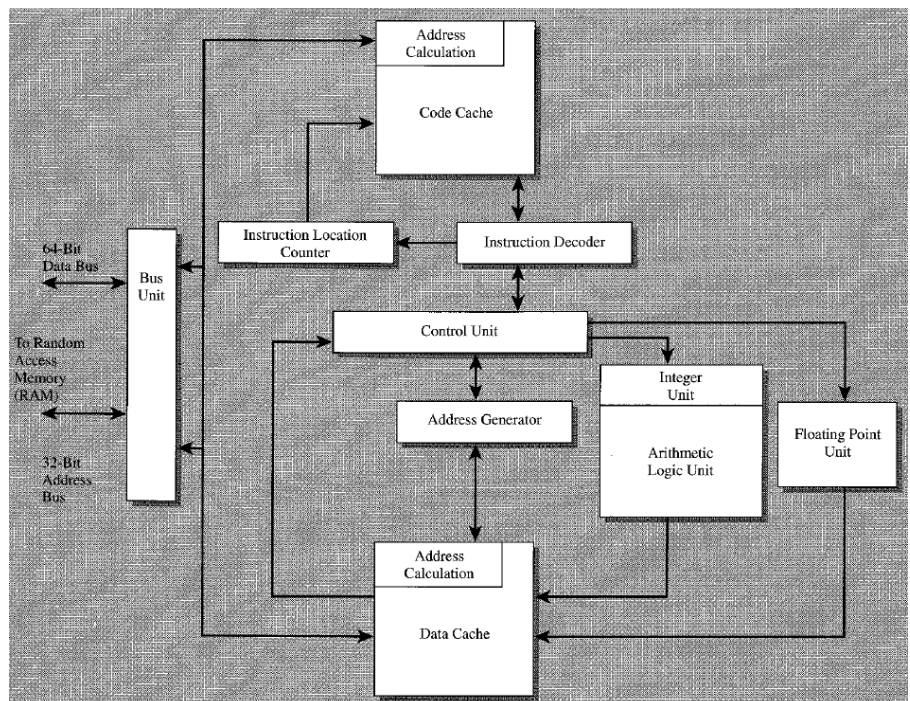
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## Information Technology

### ▪ Fundamentals

#### ▪ CPU



## Information Technology

- *Fundamentals*
  - *CPU*
    - *The instruction decoder determines what each instruction means*
    - *The address generator computes the address in memory for these data.*
    - *The integer unit performs integer arithmetic, and the floating-point unit performs floating-point arithmetic.*
    - *The arithmetic and logic unit (ALU) performs logical operations such as comparisons between two numbers.*

## Information Technology

- *Fundamentals*
  - *What makes a chip perform*
    - *Clock speed*
    - *Data path*
    - *Computation*
    - *Memory size*
    - *Floating-point arithmetic*
    - *Number of transistors per chip*
    - *Pipe lined execution*

## Information Technology

- *Fundamentals*
  - *What Techniques Increase Speed*
    - *Cache memory*
      - *When the computer reads from the disk, the cache memory is filled with the data requested and with extra data nearby.*
    - *A pipelined computer breaks down instructions into many small steps like an assembly line. Each of these steps or stages is handled by a separate circuit.*
    - *The Pentium chip features two integer execution units, each fed by its own instruction pipeline, also called superscalar architecture*

## Information Technology

- *Fundamentals*
  - *What Techniques Increase Speed*
    - *Many of today' s PC applications depend on graphic features, so manufacturers have turned their attention to the video controller and its role in the computer.*
    - *Graphics accelerator cards are video controllers that actually have a processor chip and a large amount of memory (say, a megabyte or more) to offload the display task from the CPU*

## Information Technology

- *Fundamentals*
  - *Input/output*

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### POPULAR INPUT-OUTPUT DEVICES

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Both input and output	Input devices	Output devices
PC Terminal	Keyboard Mouse Scanning Image Optical Character Recognition Bar code Touch screen Voice	Printers Laser Inkjet Voice Graphics

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## Information Technology

- *Fundamentals*
  - *Input/output*
    - *Barcoding*















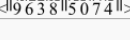

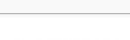
- *Bar coding is an extremely popular way of entering data into a computer. We encounter a form of bar coding in grocery stores equipped with checkout scanners. These devices use a laser to read the universal product code (UPC)*
- *Other types of bar codes are used extensively in the manufacturing industry.*
  - *In a highly automated factory, parts are marked with bar codes. The codes direct the flow of the part through the factory and may even indicate to a machine what operations to perform on it.*

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## Information Technology

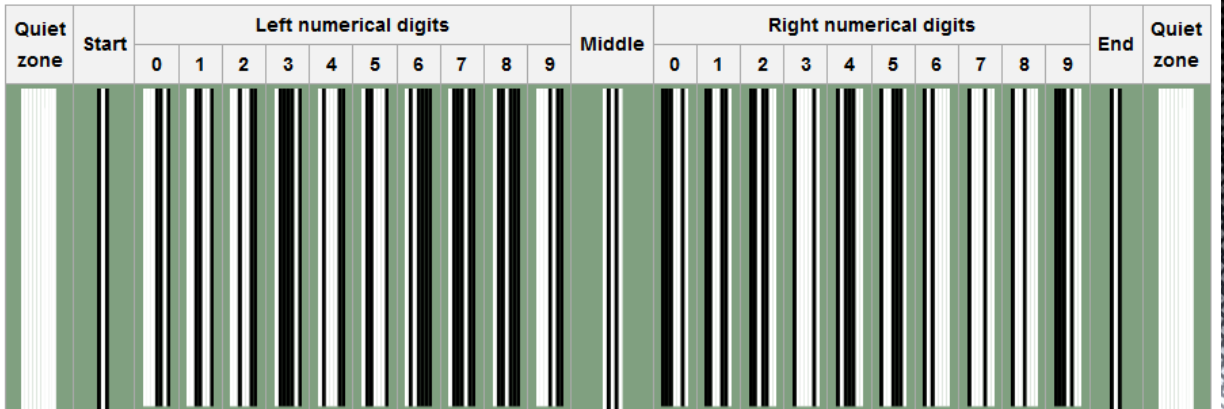
Example	Symbology	Continuous or discrete	Bar widths	Uses
	Codabar	Discrete	Two	Old format used in libraries and blood banks and on airbills (out of date)
	Code 25 – Non-interleaved 2 of 5	Continuous	Two	Industrial
	Code 25 – Interleaved 2 of 5	Continuous	Two	Wholesale, libraries International standard ISO/IEC 16390
	Code 11	Discrete	Two	Telephones (out of date)
	Code 39	Discrete	Two	Various – international standard ISO/IEC 16388
	Code 49	Continuous	Many	Various
	Code 93	Continuous	Many	Various
	Code 128	Continuous	Many	Various – International Standard ISO/IEC 15417

	EAN 2	Continuous	Many	Addon code (magazines), <b>GS1</b> -approved – not an own symbology – to be used only with an EAN/UPC according to ISO/IEC 15420
	EAN 5	Continuous	Many	Addon code (books), <b>GS1</b> -approved – not an own symbology – to be used only with an EAN/UPC according to ISO/IEC 15420
	EAN-8, EAN-13	Continuous	Many	Worldwide retail, <b>GS1</b> -approved – International Standard ISO/IEC 15420
	Facing Identification Mark	Discrete	Two	USPS business reply mail
	GS1-128 (formerly named UCC/EAN-128), incorrectly referenced as <b>EAN 128</b> and <b>UCC 128</b>	Continuous	Many	Various, <b>GS1</b> -approved – just an application of the Code 128 (ISO/IEC 15417) using the ANS MH10.8.2 AI Datastructures. Its not a separate symbology.
	GS1 DataBar, formerly Reduced Space Symbology (RSS)	Continuous	Many	Various, <b>GS1</b> -approved
	Intelligent Mail barcode	Discrete	4 bar heights	United States Postal Service, replaces both POSTNET and PLANET symbols (formerly named <b>OneCode</b> )
	ITF-14	Continuous	Two	Non-retail packaging levels, <b>GS1</b> -approved – is just an Interleaved 2/5 Code (ISO/IEC 16390) with a few additional specifications, according to the GS1 General Specifications



## Information Technology

- *Fundamentals*
  - *Input/output*
    - *Barcoding*



## Information Technology

- *Fundamentals*
  - *Input/output*
    - *Optical character recognition (OCR)*
      - *An OCR software package reads the image and converts the characters in the image to ASCII.*
- *To recognize letters or characters, the OCR software compares the input with a series of stored characters attempting to find the best match.*

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