Department of Computer Applications

Gist of lectures as per syllabus

 Session 2017 – 2018

Honors Paper IX - Web Technology

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Topic 1:Dynamic HTML:

Dynamic HyerText Markup Language (DHTML) is a combination of Web development technologies used to create dynamically changing websites. Web pages may include animation, dynamic menus and text effects. The technologies used include a combination of HTML, JavaScript or VB Script, CSS and the document object model (DOM).

Topic 2:Java Script:

Javascript is a dynamic computer programming language. It is lightweight and most commonly used as a part of web pages, whose implementations allow client-side script to interact with the user and make dynamic pages. It is an interpreted programming language with object-oriented capabilities.

Topic 3:Active Server Page:

An Active Server Pages (ASP) provide skills in server-side scripting technology that is used to create interactive Web applications. Using ADO objects of ASP ,database connectivity with MSAccess and Oracle can be established.

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 Paper BCA102- INTRODUCTION TO COMPUTER SCIENCE

**Topic 1:Introduction to Computers**

A computer is a multipurpose electronic device that can receive process and store data. Computer can be classified into different categories according to its functionality. Computers nowadays are complex; there are a lot of different components inside them, and they all serve different purposes.

**Topic 2:Number Systems And Logic Gates**

Apart from the decimal system, we have binary system, octal system and hexadecimalsystems out of which it is the binary system that holds importance in the digital world.

A gate is just a digital circuit having one or more input signals but the output is one. These gates find importance in making combinational logic circuits that is the output signal will appear only for certain combinations of the input signal. In other words, these are the building blocks for today’s integrated circuits. OR, NOT, AND, NOR and NAND gates are some commonly used gates

**Topic 3:Computer Architecture**

A general-purpose computer has these parts: processor: the ``brain'' that does arithmetic, responds to incoming information, and generates outgoing information. ... It is connected to the processor by a system bus (wiring)..

**Topic 4:Primary Memory & Secondary storage**

CPU access data from RAM which is primary memory. RAM has less capacity than secondary storage. Secondary storage is used to store huge data permanently. It has more capacity of storing data but accessible from CPU is slow.

**Topic 5:Input Devices & Output Devices**

Usage of computer needs both input and output devices. Input devices such as scanner, keyboard, bar code reader etc and output devices such as monitor, printer etc. With these input & output devices we can read data , process it and display useful information.

**Topic 6:Computer Program, Computer Languages, Computer Software**

Program is a set of instruction given to a computer which work correspondingly. There are many languages developed as per the generations of computer to solve users problems. Computer software like system software which give service to functioning of a system and application software gives the environment to user to work effeicently.

**Topic 7:Operating System**

Operating System is a system software which perform various tasks including I/O management, memory management etc. Types of operating system are categorized into two major parts single user and multiuser os.

**Topic 8: Data Communication and Computer Network, Internet Basics**

A computer network or data network is a digital telecommunications network which allows nodes to share resources. In computer networks, networked computing devices exchange data with each other using a data link. The connections between nodes are established using either cable media or wireless media.

After invention of computer there was a need of sharing data among the computer systems so that necessity helps in developing network through which not only a city and a country connected but also whole world is connected. Network is broadly categorized into two.on the basis of transmission technology it is divided into two point to point and Broadcast networks and on the basis of geographical coverage it is divided into three LAN,MAN and WAN.

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Paper BCA203- LOGIC DESIGN

**Topic 1:Binary Systems**

In Digital electronics, a binary number is a number expressed in the binary numeral system or base-2 numeral system which represents numeric values using two different symbols: typically 0 (zero) and 1 (one). The base-2 system is a positional notation with a radix of 2. Because of its straightforward implementation in digital electronic circuitry using logic gates, the binary system is used internally by almost all modern computers and computer-based devices. Each digit is referred to as a bit.

**Topic 2:Boolean Algebra and Logic Gates**

Boolean Algebra is used to analyze and simplify the digital (logic) circuits. It uses only the binary numbers i.e. 0 and 1. It is also called as Binary Algebra or logical Algebra. Boolean algebra was invented by George Boole in 1854.

A gate is just a digital circuit having one or more input signals but the output is one. These gates find importance in making combinational logic circuits that is the output signal will appear only for certain combinations of the input signal. In other words, these are the building blocks for today’s integrated circuits. OR, NOT, AND, NOR and NAND gates are some commonly used gates

**Topic 3:Gate - Level Minimization:**

A Karnaugh map provides a pictorial method of grouping together expressions with common factors and therefore eliminating unwanted variables. The Karnaugh map can also be described as a special arrangement of a truth table.The logic simplification examples that we have done so could have been performed with Boolean algebra about as quickly.

**Topic 4:Combinational Logic:**

combinational logic circuits are designed to produce specific outputs from certain inputs. Combinational logic circuits are generally designed by connecting together or combining the basic logic gates such as NAND, NOR, and NOT.Adders ,Subtarctor, encoder etc are the examples of combinational circuit

**Topic 5:Synchronous Sequential Logic**

A sequential circuit which has additional inputs that may change its present state is also referred to as *a finite-state machine* (FSM). In general, the output sequence of an FSM depends on the input sequence and the present state of flip-flops of the FSM. There are two main types of sequential circuit Asynchronous and Synchronous.Synchronous types use pulsed or level inputs and a clock input to drive the circuit (with restrictions on pulse width and circuit propagation).

**Topic 6:Registers and Circuits**

A Processor register (CPU register) is one of a small set of data holding places that are part of the computer processor. A register may hold an instruction, a storage address, or any kind of data (such as a bit sequence or individual characters). Some instructions specify registers as part of the instruction.

**Topic 7:Memory and Programmable Logic**

There are two types of memories that are used in digital systems:Random-access memory(RAM): perform both the write and read operations and Read-only memory(ROM): perform only the read operation.The read-only memory is a programmable logic device. Other such units are the programmable logic array(PLA), the programmable array logic(PAL).

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Paper BCA302- SOFTWARE ENGINEERING PRINCIPLES

**Topic 1:Software Project Management**

A Software Project is the complete procedure of software development from requirement gathering to testing and maintenance, carried out according to the execution methodologies, in a specified period of time to achieve intended software product. software project management is essential to incorporate user requirements along with budget and time constraints. Project management software caters to the following primary functions Project planning, Task management, Time tracking etc.

**Topic 2:Software Design**

Software design is a process to transform user requirements into some suitable form, which helps the programmer in software coding and implementation. Software design yields three levels of results like Architectural Design, High-level Design, Detailed Design.

**Topic 3:Coding and Testing of Software**

Software Testing is evaluation of the software against requirements gathered from users and system specifications. Testing is conducted at the phase level in software development life cycle or at module level in program code. Software testing comprises of Validation and Verification.

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Paper BCA304- OPERATING SYSTEM & LINUX PROGRAMMING

**Topic 1:Introduction**

An operating system (OS) is the program that, after being initially loaded into the computer by a [boot](http://searchwinit.techtarget.com/definition/boot) program, manages all the other programs in a computer. The other programs are called *applications* or application programs. users can interact directly with the operating system through a user interface such as a command line or a graphical user interface ([GUI](http://searchwindevelopment.techtarget.com/definition/GUI)).

**Topic 2:Computer-System Structures**

 I/O devices and the CPU can execute concurrently. Each device controller is in charge of a particular device type. ... Device controller informs CPU that it has finished its operation by causing an interrupt

**Topic 3:Operating-System Structures**

The design of an operating system architecture traditionally follows the separation of concerns principle. This principle suggests structuring the operating system into relatively independent parts that provide simple individual features, thus keeping the complexity of the design manageable.Besides managing complexity, the structure of the operating system can influence key features such as robustness or efficiency.The operating system posesses various privileges that allow it to access otherwise protected resources such as physical devices or application memory.

**Topic 4:Processes**

A **process** is an instance of a computer program that is being executed. It contains the program code and its current activity. Depending on the **operating system** (**OS**), a **process** may be made up of multiple threads of execution that execute instructions concurrently.

**Topic 5:CPU Scheduling**

CPU scheduling is a process which allows one process to use the CPU while the execution of another process is on hold(in waiting state) due to unavailability of any resource like I/O etc, thereby making full use of CPU. The aim of CPU scheduling is to make the system efficient, fast and fair.Whenever the CPU becomes idle, the operating system must select one of the processes in the **ready queue** to be executed. The selection process is carried out by the short-term scheduler (or CPU scheduler). The scheduler selects from among the processes in memory that are ready to execute, and allocates the CPU to one of them.

**Topic 6:Storage Management**

Memory management is the functionality of an operating system which handles or manages primary memory and moves processes back and forth between main memory and disk during execution. Memory management keeps track of each and every memory location, regardless of either it is allocated to some process or it is free. It checks how much memory is to be allocated to processes. It decides which process will get memory at what time. It tracks whenever some memory gets freed or unallocated and correspondingly it updates the status. Various memory management techniques are paging,swapping etc.

**Topic 7:File-System Interface**

A file is a named collection of related information that is recorded on secondary storage such as magnetic disks, magnetic tapes and optical disks. In general, a file is a sequence of bits, bytes, lines or records whose meaning is defined by the files creator and user.

File access mechanism refers to the manner in which the records of a file may be accessed. There are several ways to access files such as Sequential access,Direct/Random access,Indexed sequential access.

**Topic 8:Mass-Storage Structure**

In modern computers, most of the secondary storage is in the form of magnetic disks. Hence, knowing the structure of a magnetic disk is necessary to understand how the data in the disk is accessed by the computer. A magnetic disk contains several **platters**. Each platter is divided into circular shaped **tracks**. The length of the tracks near the centre is less than the length of the tracks farther from the centre. Each track is further divided into **sectors**. On a typical multiprogramming system, there will usually be multiple disk access requests at any point of time. So those requests must be scheduled to achieve good efficiency. Disk scheduling is similar to process scheduling. Some of the disk scheduling algorithms are FCFS,SSTF,SCAN,C-SCAN etc.

**Topic 9:The Linux System:**

Linux is one of popular version of UNIX operating System. It is open source as its source code is freely available. It is free to use. Linux was designed considering UNIX compatibility. Its functionality list is quite similar to that of UNIX. Linux, like Mac OS X, is based on the Unix operating system. A research team at AT&T’s Bell Labs developed Unix in the late 1960s and early 1970s with a focus on creating an operating system that would be accessible and secure for multiple users.

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Paper BCA 403 PROGRAMMING IN VISUAL BASIC

**Topic 1:Integrated Development Environment**

An integrated development environment (IDE), also known as integrated design environment and integrated debugging environment, is a type of computer software that assists computer programmers to develop software.

## The Visual Basic integrated development environment (IDE) consists of the following elements like Project Explorer Window, Properties Window, Toolbox etc.

**Topic 2:Introduction to Visual Basic Programming**

Visual Basic is a third-generation event-driven programming language and integrated development environment (IDE) from Microsoft for its Component Object Model (COM) programming model first released in 1991 and declared legacy during 2008. Microsoft intended VisualBasic to be relatively easy to learn and use.

Decision making process is an important part of programming because it will help solve practical problems intelligently so that it can provide useful output or feedback to the user.

**Topic 3:Control Structures**

Control structures allow you to control the flow of your program's execution. If left unchecked by control-flow statements, a program's logic will flow through statements from left to right, and top to bottom. While some very simple programs can be written with only this unidirectional flow, and while some flow can be controlled by using operators to regulate precedence of operations, most of the power and utility of any programming language comes from its ability to change statement order with structures and loops.

Visual Basic provides seven types of repetition structures  While, DoWhile/Loop,

Do/LoopWhile, DoUntil/Loop, Do/LoopUntil, For/Next and ForEach/Next. (ForEach/Next is covered in Chapter 4, Procedures and Arrays.) The words If, Then, Else, End, Select, Case, While, Do,Until, Loop, For, Next and Each are all Visual Basic keywords.

**Topic 4: Arrays**

an array is a variable with a single name that represents many different items. When we work with a single item, we only need to use one variable. However, if we have a list of items which are of similar type to deal with, we need to declare an array of variables instead of using a variable for each item.

**Topic 5:Strings, Dates and Times**

A string is a data type used in programming, such as an integer and floating point unit, but is used to represent text rather than numbers. programmers must enclose strings in quotation marks for the data to recognized as a string and not a number or variable name

Visual Basic let you store date and time information in the specific Date data type, it also provides a lot of date- and time-related functions. Date and Time are internally stored as numbers in Visual Basic.

**Topic 6: Basic Graphical User Interface Concepts**

The graphical user interface (GUI ) is a type of [user interface](https://en.wikipedia.org/wiki/User_interface) that allows [users](https://en.wikipedia.org/wiki/User_%28computing%29) to [interact with electronic devices](https://en.wikipedia.org/wiki/Human%E2%80%93computer_interaction) through graphical [icons](https://en.wikipedia.org/wiki/Computer_icon) and visual indicators such as secondary notation, instead of [text-based user interfaces](https://en.wikipedia.org/wiki/Text-based_user_interface), typed command labels or text navigation.

**Topic 7:Advanced Graphical User Interface Concepts**

A multiple document interface is used for opening many windows at the same time. All the document windows are contained in a parent window, which provides a workspace in the application. Visual Basic applications can have only one MDI form, which contains all the child forms. A child form is an ordinary form that has its child property set to True. Child forms are displayed within the internal area of a MDI form at run time. Mainly there are two styles of interfaces in the windows based application: the single-document interface (SDI) and the multiple – document interface (MDI).

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Paper BCA 401 DATA COMMUNICATION AND COMPUTER NETWORK

 **Topic 1: Data Line Devices**

A modem is a hardware device that allows a computer to send and receive data over a telephone line or a cable or satellite connection. Digital subscriber line (DSL; originally digital subscriber loop) is a family of technologies that are used to transmit digital data over telephone lines.

**Topic 2:Data Link Layer**

It is a layer between physical and network layer. This layer is responsible to provide flow control in which data send from source to destination in sucha way that it does not overwhelms the destination and provides error control which detect and correct errors

**Topic 3:Network Layer**

The network layer is the third level of the Open Systems Interconnection Model (OSI Model) and the layer that provides data routing paths for network communication. Data is transferred in the form of packets via logical network paths in an ordered format controlled by the network layer.