SEMESTER – II

C-14&15

PEDAGOGY OF COMPUTER SCIENCE-II

TOTAL MARKS: 50 (THEORY: 40 + INTERNAL ASSESSMENT: 10)

UNIT-1

ELEMENTS OF PROGRAMMING LANGUAGE

A) ALGORITHM, FLOWCHART, ELEMENTS OF 'C' PROGRAMMING WITH SIMPLE ILLUSTRATIONS.

ALGORITHM

An algorithm (pronounced AL-go-rith-um) is a procedure or formula for solving a problem. The word derives from the name of the mathematician, Mohammed ibn-Musa al-Khwarizmi, who was part of the royal court in Baghdad and who lived from about 780 to 850.

FLOWCHART

A **flowchart** is a type of diagram that represents an algorithm, workflow or process, showing the steps as boxes of various kinds, and their order by connecting them with arrows. This diagrammatic representation illustrates a solution model to a given problem.A flowchart is a visual representation of the sequence of steps and decisions needed to perform a process. Each step in the sequence is noted within a diagram shape. Steps are linked by connecting lines and directional arrows. This allows anyone to view the flowchart and logically follow the process from beginning to end.

ELEMENTS OF 'C' PROGRAMMING WITH SIMPLE ILLUSTRATIONS.

We are going to learn a simple "Hello World" C program in this section. Also, all the below topics are explained in this section which are the basics of a C program.

1. C basic program with output and explanation
2. Steps to write C programs and get the output
3. Creation, Compilation and Execution of a C program
    1. How to install C compiler and IDE
4. Basic structure of a C program

BASIC COMMANDS IN C PROGRAMMING TO WRITE BASIC C PROGRAM:

Below are few commands and syntax used in C programming to write a simple C program. Let's see all the sections of a simple C program line by line.

S.no	Command	Explanation
1	#include <stdio.h>	This is a preprocessor command that includes standard input output header file(stdio.h) from the C library before compiling a C program
2	int main()	This is the main function from where execution of any C program begins.
3	{	This indicates the beginning of the main function.
4	/*_some_comments_*/	whatever is given inside the command "/* */" in any C program, won't be considered for compilation and execution.
5	printf("Hello_World! ");	printf command prints the output onto the screen.
6	getch();	This command waits for any character input from keyboard.
7	return 0;	This command terminates C program (main function) and returns 0.
8	}	This indicates the end of the main function.

1. C Basic Program:

```
#include <stdio.h>
intmain()
{
/* Our first simple C basic program */
printf("Hello World! ");
getch();
return 0;
}
```

.

Output:

```
Hello
World!
```

.

2. Steps to write C programs and get the output:

Below are the steps to be followed for any C program to create and get the output. This is common to all C program and there is no exception whether its a very small C program or very large C program.

3. Creation, Compilation and Execution of a C program:

Prerequisite:

1. If you want to create, compile and execute C programs by your own, you have to install C compiler in your machine. Then, you can start to execute your own C programs in your machine.
2. You can refer below link for how to install C compiler and compile and execute C programs in your machine.
3. Once C compiler is installed in your machine, you can create, compile and execute C programs as shown in below link.

4. Basic structure of C program:

Structure of C program is defined by set of rules called protocol, to be followed by programmer while writing C program. All C programs are having sections/parts which are mentioned below.

1. Documentation section
2. Link Section
3. Definition Section
4. Global declaration section
5. Function prototype declaration section
6. Main function
7. User defined function definition section

Example C program to compare all the sections:

You can compare all the sections of a C program with the below C program.

```
/* C basic structure program Documentation section
Author: fresh2refresh.com
Date : 01/01/2012
*/#include <stdio.h> /* Link section */
int total = 0; /* Global declaration and definition section */
int sum (int, int); /* Function declaration section */
int main () /* Main function */
{
printf (“This is a C basic program \n”);
total = sum (1, 1);
printf (“Sum of two numbers : %d \n”, total);
return 0;
}
int sum (int a, int b) /* User defined function */
{ /* definition section */
return a + b;
}
```

.

Output:

This is a C basic program
Sum of two numbers :
2
.

Description for each section of a C program:

1. Let us see about each section of a C basic program in detail below.
2. Please note that a C program mayn't have all below mentioned sections except main function and link sections.
3. Also, a C program structure mayn't be in below mentioned order.

S.No	Sections	Description
1	Documentation section	We can give comments about the program, creation or modified date, author name etc in this section. The characters or words or anything which are given between "/*" and "*/", won't be considered by C compiler for compilation process.These will be ignored by C compiler during compilation. Example : /* comment line1 comment line2 comment 3 */
2	Link Section	Header files that are required to execute a C program are included in this section
3	Definition Section	In this section, variables are defined and values are set to these variables.
4	Global declaration section	Global variables are defined in this section. When a variable is to be used throughout the program, can be defined in this section.
5	Function prototype declaration section	Function prototype gives many information about a function like return type, parameter names used inside the function.
6	Main function	Every C program is started from main function and this function contains two major sections called declaration section and executable section.
7	User defined function section	User can define their own functions in this section which perform particular task as per the user requirement.

B) ELEMENTS OF DATABASE AND ITS APPLICATIONS,

Database Management Systems (DBMS)

A database-management system (DBMS) is a collection of interrelated data and a set of programs to access those data. This is a collection of related data with an implicit meaning and

hence is a database. The collection of data, sually referred to as the database, contains information relevant to an nterprise. The primary goal of a DBMS is to provide a way to store and retrieve database information that is both convenient and efficient. By data, we mean known facts that can be recorded and that have implicit meaning. For example, consider the names, telephone numbers, and addresses of the

people you know. You may have recorded this data in an indexed address book, or you may have stored it on a diskette, using a personal computer and software such as DBASE IV or V, Microsoft ACCESS, or EXCEL. A datum

– a unit of data – is a symbol or a set of symbols which is used to represent some thing. This relationship between symbols and what they represent is the essence of what we mean by information. Hence, information is interpreted data – data supplied with semantics. Knowledge refers to the practical use

of information. While information can be transported, stored or shared without many difficulties the same cannot be said about knowledge. Now ledge necessarily involves a personal experience. Referring back to the scientific experiment, a third person reading the results will have information about it, while the person who conducted the experiment personally will have knowledge about it. Database systems are designed to manage large bodies of information. Management of data involves both defining structures for to rage of information and providing mechanisms for the manipulation of information. In addition, the database system must ensure the safety of the information stored, despite system crashes or attempts at unauthorized access. If data are to be shared among several users, the system must avoid possible anomalous results. Because information is so important in most organizations, computer scientists have developed a large body of concepts and techniques for managing data. These concepts and technique form the focus of this book. This chapter briefly introduces the principles of database systems. 2

Data Processing Vs. Data Management Systems

Although Data Processing and Data Management Systems both refer to ns that take raw data and transform it into usable Information, the usage of the terms is very different. Data Processing is the term generally used to describe what was done by large mainframe computers from the late 1940's until the early 1980's (and which continues to be done in most large organizations to a greater or lesser extent even today): large volumes of raw transaction data fed into programs that update a master file, with fixed-format reports written to paper. The term Data Management Systems refers to an expansion of this concept, where the raw data, previously copied manually from paper to punched cards, and later into data-entry terminals, is now fed into the system from a variety of sources, including ATMs, EFT, and direct customer entry through the Internet. The master file concept has been largely displaced by database management systems, and static reporting replaced or augmented by ad-hoc reporting and direct inquiry, including downloading of data by customers. The ubiquities of the Internet and the Personal Computer have been the driving force in the transformation of Data Processing to the more global concept of Data Management Systems.

File Oriented Approach

The earliest business computer systems were used to process business records and

produce information. They were generally faster and more accurate than equivalent manual systems. These systems stored groups of records in separate files, and so they were called file processing systems. In a typical file processing systems, each department has its own files, designed specifically for those applications. The department itself working with the data processing staff,

sets policies or standards for the format and maintenance of its files. Programs are dependent on the files and vice-versa; that is, when the physical format of the file is changed, the program has also to be changed. Although the traditional file oriented approach to information processing is still widely used, it does have some very important disadvantages. Database Oriented Approach to Data Management

INTRODUCTION TO CLOUD COMPUTING

WHAT IS CLOUD COMPUTING?

Cloud computing is an umbrella term used to refer to Internet based development and services. The cloud is a metaphor for the Internet. A number of characteristics define cloud data, applications services and infrastructure:

1. Remotely hosted: Services or data are hosted on someone else's infrastructure.
2. Ubiquitous: Services or data are available from anywhere.
3. Commoditized: The result is a utility computing model similar to traditional that of traditional utilities, like gas and electricity. You pay for what you would like.

SOFTWARE AS A SERVICE (SAAS)

SAAS is a model of software deployment where an application is hosted as a service provided to customers across the Internet. SAAS is generally used to refer to business software rather than consumer software, which falls under Web 2.0. By removing the need to install and run an application on a user's own computer it is seen as a way for businesses to get the same benefits as commercial software with smaller cost outlay. SAAS also alleviates the burden of software maintenance and support but users relinquish control over software versions and requirements. The other terms that are used in this sphere include *Platform as a Service* (PAAS) and *Infrastructure as a Service*

CLOUD STORAGE

Over time many big Internet based companies (Amazon, Google…) have come to realize that only a small amount of their data storage capacity is being used. This has led to the renting out of

space and the storage of information on remote servers or "clouds". Information is then temporarily cached on desktop computers, mobile phones or other internet-linked devices. Amazon's Amazon Elastic Compute Cloud (EC2) and Simple Storage Solution (S3) are the current best known facilities.

DATA CLOUD

Cloud Services can also be used to hold structured data. There has been some discussion of this being a potentially useful notion possibly aligned with the Semantic Web [2], though concerns, such as this resulting in data becoming undifferentiated [3], have been raised.

OPPORTUNITIES AND CHALLENGES

The use of the cloud provides a number of opportunities:

1. It enables services to be used without any understanding of their infrastructure.
2. Cloud computing works using economies of scale. It lowers the outlay expense for start up companies, as they would no longer need to buy their own software or servers. Cost would be by on-demand pricing. Vendors and Service providers claim costs by establishing an ongoing revenue stream.
3. Data and services are stored remotely but accessible from 'anywhere'.

In parallel there has been backlash against cloud computing:

1. Use of cloud computing means dependence on others and that could possibly limit flexibility and innovation. The 'others' are likely become the bigger Internet companies like Google and IBM who may monopolise the market. Some argue that this use of supercomputers is a return to the time of mainframe computing that the PC was a reaction against.
2. Security could prove to be a big issue. It is still unclear how safe outsourced data is and when using these services ownership of data is not always clear.
3. There are also issues relating to policy and access. If your data is stored abroad whose FOI policy do you adhere to? What happens if the remote server goes down? How will you then access files? There have been cases of users being locked out of accounts and losing access to data.

c) Network of Computers: Network, Types of network, Categories of network.

A network consists of two or more computers that are linked in order to share resources (such as printers and CDs), exchange files, or allow electronic communications. The computers on a network may be linked through cables, telephone lines, radio waves, satellites, or infrared light beams.

Two very common types of networks include:

1. Local Area Network (LAN)
2. Wide Area Network (WAN)

You may also see references to a Metropolitan Area Networks (MAN), a Wireless LAN (WLAN), or a Wireless WAN (WWAN).

LOCAL AREA NETWORK

A Local Area Network (LAN) is a network that is confined to a relatively small area. It is generally limited to a geographic area such as a writing lab, school, or building.

Computers connected to a network are broadly categorized as servers or workstations. Servers are generally not used by humans directly, but rather run continuously to provide "services" to the other computers (and their human users) on the network. Services provided can include printing and faxing, software hosting, file storage and sharing, messaging, data storage and retrieval, complete access control (security) for the network's resources, and many others.

Workstations are called such because they typically do have a human user which interacts with the network through them. Workstations were traditionally considered a desktop, consisting of a computer, keyboard, display, and mouse, or a laptop, with with integrated keyboard, display, and touchpad. With the advent of the tablet computer, and the touch screen devices such as iPad and iPhone, our definition of workstation is quickly evolving to include those devices, because of their ability to interact with the network and utilize network services.

Servers tend to be more powerful than workstations, although configurations are guided by needs. For example, a group of servers might be located in a secure area, away from humans, and only accessed through the network. In such cases, it would be common for the servers to operate without a dedicated display or keyboard. However, the size and speed of the server's processor(s), hard drive, and main memory might add dramatically to the cost of the system. On the other hand, a workstation might not need as much storage or working memory, but might require an expensive display to accommodate the needs of its user. Every computer on a network should be appropriately configured for its use.

On a single LAN, computers and servers may be connected by cables or wirelessly. Wireless access to a wired network is made possible by wireless access points (WAPs). These WAP devices provide a bridge between computers and networks. A typical WAP might have the theoretical capacity to connect hundreds or even thousands of wireless users to a network, although practical capacity might be far less.

Nearly always servers will be connected by cables to the network, because the cable connections remain the fastest. Workstations which are stationary (desktops) are also usually connected by a cable to the network, although the cost of wireless adapters has dropped to the point that, when installing workstations in an existing facility with inadequate wiring, it can be easier and less expensive to use wireless for a desktop.

Wide Area Network

Wide Area Networks (WANs) connect networks in larger geographic areas, such as Florida, the United States, or the world. Dedicated transoceanic cabling or satellite uplinks may be used to connect this type of global network.

Using a WAN, schools in Florida can communicate with places like Tokyo in a matter of seconds, without paying enormous phone bills. Two users a half-world apart with workstations equipped with microphones and a webcams might teleconference in real time. A WAN is complicated. It uses multiplexers, bridges, and routers to connect local and metropolitan networks to global communications networks like the Internet. To users, however, a WAN will not appear to be much different than a LAN.

Advantages of Installing a School Network

User access control.

Modern networks almost always have one or more servers which allows centralized management for users and for network resources to which they have access. User credentials on a privately-owned and operated network may be as simple as a user name and password, but with ever-increasing attention to computing security issues, these servers are critical to ensuring that sensitive information is only available to authorized users.

Information storing and sharing.

Computers allow users to create and manipulate information. Information takes on a life of its own on a network. The network provides both a place to store the information and mechanisms to share that information with other network users.

Connections.

Administrators, instructors, and even students and guests can be connected using the campus network.

Services.

The school can provide services, such as registration, school directories, course schedules, access to research, and email accounts, and many others. (Remember, network services are generally provided by servers).

Internet.

The school can provide network users with access to the internet, via an internet gateway.

Computing resources.

The school can provide access to special purpose computing devices which individual users would not normally own. For example, a school network might have high-speed high quality printers strategically located around a campus for instructor or student use.

Flexible Access.

School networks allow students to access their information from connected devices throughout the school. Students can begin an assignment in their classroom, save part of it on a public access area of the network, then go to the media center after school to finish their work. Students can also work cooperatively through the network.

Workgroup Computing.

Collaborative software allows many users to work on a document or project concurrently. For example, educators located at various schools within a county could simultaneously contribute their ideas about new curriculum standards to the same document, spreadsheets, or website.

Disadvantages of Installing a School Network

Expensive to Install.

Large campus networks can carry hefty price tags. Cabling, network cards, routers, bridges, firewalls, wireless access points, and software can get expensive, and the installation would certainly require the services of technicians. But, with the ease of setup of home networks, a simple network with internet access can be setup for a small campus in an afternoon.

Requires Administrative Time.

Proper maintenance of a network requires considerable time and expertise. Many schools have installed a network, only to find that they did not budget for the necessary administrative support.

Servers Fail.

Although a network server is no more susceptible to failure than any other computer, when the files server "goes down" the entire network may come to a halt. Good network design practices say that critical network services (provided by servers) should be redundant on the network whenever possible.

Cables May Break.

The Topology chapter presents information about the various configurations of cables. Some of the configurations are designed to minimize the inconvenience of a broken cable; with other configurations, one broken cable can stop the entire network.

Security and compliance.

Network security is expensive. It is also very important. A school network would possibly be subject to more stringent security requirements than a similarly-sized corporate network, because of its likelihood of storing personal and confidential information of network users, the danger of which can be compounded if any network users are minors. A great deal of attention must be paid to network services to ensure all network content is appropriate for the network community it serves.

D) WORLD WIDE WEB - BROWSING AND SEARCH ENGINES,

The **World Wide Web** (**WWW**) is an open source information space where documents and other web resources are identified by URLs, interlinked by hypertext links, and can be accessed via the Internet. The World Wide Web was invented by English scientist Tim Berners-Lee in 1989. He wrote the first web browser in 1990 while employed at CERN in Switzerland.

It has become known simply as **the Web**. The World Wide Web was central to the development of the Information Age and is the primary tool billions of people use to interact on the Internet.

Web pages are primarily text documents formatted and annotated with Hypertext Markup Language (HTML). In addition to formatted text, web pages may contain images, video, and software components that are rendered in the user's web browser as coherent pages of multimedia content. Embedded hyperlinks permit users to navigate between web pages. Multiple web pages with a common theme, a common domain name, or both, may be called a *website*. Website content can largely be provided by the publisher, or interactive where users contribute content or the content depends upon the user or their actions. Websites may be mostly informative, primarily for entertainment, or largely for commercial purposes.

Search engines are the largest of the finding aids and often search the full text of many Web pages. The resources found are often numerous, numbering in the millions (representing billions of words), though not always well selected for quality or subject relevance. Even though they can be difficult to use and frequently result in many false drops, for many topics they are essential. However, be prepared to sift through many inconsequential pages to find what you want.

Search engines use spiders or robots (a type of software tool), to continually comb vast domains of Internet documents for information. Resources found are placed in the search engine's databases which are made available for searching by the user.

Users can connect to a search engine site and enter keywords to query the index. The best matches, whether Web pages or other Internet resources, are then returned as hits.

Search engines vary according to the size of the index, the frequency of updating the index, the search options, the speed of returning a result set, the result set presentation, the relevancy of the items included in a result set, and the overall ease of use.

It is important to remember that most resources on the Internet are not subject indexed at all like the resources listed in a card catalog. The library cataloger spends much time and energy selecting the perfect few words that describe the resource and using the same words in a consistent manner. When a search engine selects a page based on a keyword request, it does not pay attention to how the word is used on that page. Pages created by many different people may use the same word in different ways and in different contexts. For example, one person may use the word "Madonna" to describe a religious figure while someone else is discussing the rock star. Even more frustrating is that a word may be used on a page to describe what is not going to be discussed, but the search engine cannot differentiate.

Some search engines are now indexing Web documents by the meta tags in the documents' HTML which are invisible to the browser. What this means is that the Web page author can have some influence over which keywords are used to index the document, and even in the description of the document that appears when it comes up as a search engine hit.

Unless the author of the Web document specifies the keywords for his or her document, it's up to the search engine to determine them. Each search engine has its own way of doing this, which is called its search algorithm. Some pull out words that are believed to be significant and ignore words believed to be insignificant. Some index every word on a page, some only part of the page. Sometimes words that are mentioned towards the top of a document and words that are repeated several times throughout the document are more likely to be considered important.

For the most part, search engines do not understand synonyms. A query on the moon would not return a document that used the word "lunar."

The better navigators allow more precision in searching via Boolean and/or proximity operators as well as through various weighting schemes (e.g., the frequency of occurrence of a chosen word in a document).

Some navigators are more useful for one subject than another. Most yield better results if one is able to do fairly precise searching on clearly defined concepts.

Some search engines also allow one to restrict one's search to certain parts of the Internet (i.e., Usenet or the Web) or to specific parts of Web documents (i.e., the title, author, abstract, keyword or URL).

Because the Internet is always growing and because these search engines search in different ways and search different parts of the Internet, doing the same search using different search engines will often give you wildly differing results. Eventually one learns with practice which search engines work best for individual searching styles and topics. But the learning is a continuing process. The most important thing to remember is not to get stuck just using one method of searching or one search engine.

E) INTERNET – MEANING – WORKING PRINCIPLE – TYPES – LAN – WI-FI – USES

A means of connecting a computer to any other computer anywhere in the world via dedicated routers and servers. When two computers are connected over the Internet, they can send and receive all kinds of information such as text, graphics, voice, video, and computer programs.

No one owns Internet, although several organizations the world over collaborate in its functioning and development. The high-speed, fiber-optic cables (called backbones) through which the bulk of the Internet data travels are owned by telephone companies in their respective countries.

The Internet grew out of the Advanced Research Projects Agency's Wide Area Network (then called ARPANET) established by the US Department Of Defense in 1960s for collaboration in military research among business and government laboratories.

TYPES – LAN – WI-FI – USES

There are many ways in which different networks can be classified, such as their size, capabilities and the geographical distance they cover. A network is simply a group of two or more computer systems linked together in some way so that they can share data between them. Different types of networks provide different services, and require different things to work properly.

Most network types are known as different types of 'area' networks – this is due to the history of networks, and dates back to the time when computer networks were defined by their literal scale. This is no longer always the case due to new technology. Some of the most common types of network you are likely to encounter are detailed here below:

1. Local Area Network (LAN)

This is one of the original categories of network, and one of the simplest. LAN networks connect computers together over relatively small distances, such as within a single building or within a small group of buildings.

Homes often have LAN networks too, especially if there is more than one device in the home. Often they do not contain more than one subnet, if any, and are usually controlled by a single administrator. They do not have to be connected to the internet to work, although they can be.

1. Wide Area Network (WAN)

This is another of the original categories of network, and slightly more complex in nature. WAN networks connect computers together over large physical distances, remotely connecting them over one huge network and allowing them to communicate even when far apart. The Internet is a WAN, and connects computers all around the world together.

LANs connect to WANs, such as the internet, using routers to transfer data and information quickly and securely. WANs are usually too large to be controlled by one administrator, and so usually have collective ownership, or in the case of the internet, is publicly owned.

1. How do LANs and WANs connect?

LANs, such as those within a private home, usually have a modem in their residence which is connected to an Internet Service Provider. This provider assigns an IP address to the modem, which is a unique number that is given to all devices capable of connecting to the internet, including any computers, phones or consoles within the home too. While all devices in LAN can communicate with each other without using the internet, if a device wants to communicate with another which is on another LAN, they can connect to the internet and send information over the WAN.

This is achieved using a router, which receives data from devices and routes it down the quickest virtual path to its destination, going through a number of gateways on the way. First a central gateway, which divides the LAN from the WAN, and then others which send the data from one to the next, until it arrives at its final destination – the other device which is being communicated with. This all happens at a very fast speed over modern broadband modems, due to efficient and effective protocols and rules being established to control and manage data.

1. Other Types of Network

There are also other types of network you may encounter. Some of these are different, but most are simply developed from LAN and WAN networks to have slight difference and adapt to different user needs. These include:

Metropolitan Area Network

This is a network which is larger than a LAN but smaller than a WAN, and incorporates elements of both. It typically spans a town or city and is owned by a single person or company, such as a local council or a large company.

Campus Area Network – This is a network which is larger than a LAN, but smaller than an MAN. This is typical in areas such as a university, large school or small business. It is typically spread over a collection of buildings which are reasonably local to each other. It may have an internal Ethernet as well as capability of connecting to the internet.

Wireless Local Area Network

This is a LAN which works using wireless network technology such as Wi-Fi. This type of network is becoming more popular as wireless technology is further developed and is used more

in the home and by small businesses. It means devices do not need to rely on physical cables and wires as much and can organise their spaces more effectively.

System Area Network

This network connects computers together on an especially high-speed connection, in a configuration known as a cluster. This means computers which are connected together so as to work as a single system, and can be done as a result of very high speed computers and new low cost microprocessors. They are usually used to improve performance and for cost effectiveness.

Storage Area Network

This network connects servers directly to devices which store amounts of data without relying on a LAN or WAN network to do so. This can involve another type of connection known as Fibre Channel, a system similar to Ethernet which handles high-performance disk storage for applications on a number of professional networks.

Generally the two most common network types you will encounter are LAN, WAN and WLAN. This is not a full and comprehensive list of all of the types of network, however most bear similarities to the ones discussed here as a result of being developed directly from older versions such as LAN and WAN. Different networks are suitable for different needs, and as such, make sure you know your way around the types that you are most likely to use.

F) E-MAIL – MEANING & ITS WORKING;

Short for **electronic mail**, **e-mail** or **email** is information stored on a computer that is exchanged between two users over telecommunications. More plainly, e-mail is a message that may contain text, files, images, or other attachments sent through a network to a specified individual or group of individuals. The first e-mail was sent by Ray Tom linson in 1971. By 1996, more electronic mail was being sent than postal mail.

How to send and receive e-mail

E-mail Program

To send and receive e-mail messages, you can use an **e-mail program**, also known as an **e-mail client**, such as Microsoft Outlook or Mozilla Thunderbird. When using an e-mail client, you must have a server that stores and delivers your messages, which is provided by your ISP or in some cases, another company. An e-mail client needs to connect to a server to download new e-mail, whereas email stored online updates automatically when you visit the site.

E-mail Online

An alternative way of sending and receiving e-mail (and the more popular solution for most people) is an online e-mail service or webmail. Examples include Hotmail (now Outlook.com), Gmail, and Yahoo Mail. Many of the online e-mail services, including the ones we just mentioned, are free or have a free account option.

Writing an e-mail

When writing an e-mail message, it should look something like the example window below. As you can see, several fields are required when sending an e-mail:

1. The **To** field is where you type the e-mail address of the person who is the recipient of your message.
2. The **From** field should contain your e-mail address.
3. If you are replying to a message, the To and From fields are automatically filled out; if it's a new message, you'll need to enter them manually.
4. The CC or Carbon Copy field allows you to send a copy of the message to another e-mail address, but is not mandatory.
5. The **Subject Line**, although not required, should consist of a few words describing the e-mail's contents.
6. Finally, the **Message Body** is the location you type your main message. It often contains your signature at the bottom; similar to a hand-written letter.

What makes a valid e-mail address?

There are several rules that an e-mail address must follow to be valid:

1. As mentioned earlier, an e-mail must have a username followed by an @ (at sign) which is followed by the domain name with a domain suffix.
2. The username cannot be longer than 64 characters long and the domain name cannot be longer than 254 characters.
3. There should be only one **@** sign in an e-mail address.
4. The space and special characters: ( ) , : ; <> \ [ ] are allowed. Occasionally, a space, backslash, and quotation mark work but must be preceded with a forward slash. Although valid, some e-mail providers do not allow these characters.
5. The username and e-mail addresses as a whole cannot begin or end with a period.
6. The e-mail must not have two or more consecutive periods.

G) WEB DESIGN – MEANING & ITS CREATION – HTML – MEANING & IMPORTANCE.

At its heart, HTML is a fairly simple language made up of elements, which can be applied to pieces of text to give them different meaning in a document (is it a paragraph? is it a bulleted list? is it part of a table?), structure a document into logical sections (does it have a header? three columns of content? a navigation menu?) and embed content such as images and videos into a

page. This module will introduce the first two of these, and introduce fundamental concepts and syntax you need to know to understand HTML.

Prerequisites

Before starting this module, you don't need any previous HTML knowledge, but you should have at least basic familiarity with using computers, and using the Web passively (i.e. just looking at it, consuming the content.) You should have a basic work environment set up as detailed in Installing basic software, and understand how to create and manage files, as detailed in Dealing with files — both are parts of our Getting started with the web complete beginner's module.

Note: If you are working on a computer/tablet/other device where you don't have the ability to create your own files, you could try out (most of) the code examples in an online coding program such as JSBin or Thimble.

Guides

This module contains the following articles, which will take your through all the basic theory of HTML, and provide ample opportunity for you to test out some skills.

Getting started with HTML

Covers the absolute basics of HTML, to get you started — we define elements, attributes, and all the other important terms you may have heard, and where they fit in to the language. We also show how an HTML element is structured, how a typical HTML page is structured, and explain other important basic language features. Along the way, we'll have a play with some HTML, to get you interested!

What's in the head? Metadata in HTML

The head of an HTML document is the part that is not displayed in the web browser when the page is loaded. It contains information such as the page <title>, links to CSS (if you want to style your HTML content with CSS), links to custom favicons, and metadata (which is data about the HTML, such as who wrote it, and important keywords that describe the document.)

HTML text fundamentals

One of HTML's main jobs is to give text meaning (also know as semantics,) so that the browser knows how to display it correctly. This article looks at how to use HTML to break a block of text up into a structure of headings and paragraphs, add emphasis/importance to words, create lists, and more.

Creating hyperlinks

Hyperlinks are really important — they are what makes the Web a web. This article shows the syntax required to make a link, and discusses link best practices.

Advanced text formatting

There are many other elements in HTML for formatting text, which we didn't get to in the HTML text fundamentals article. The elements in here are less well-known, but still useful to know about. In here you'll learn about marking up quotations, description lists, computer code and other related text, subscript and superscript, contact information, and more.

Document and website structure

As well as defining individual parts of your page (such as "a paragraph" or "an image"), HTML is also used to define areas of your website (such as "the header", "the navigation menu", "the main content column".) This article looks into how to plan a basic website structure, and write the HTML to represent this structure.

Debugging HTML

Writing HTML is fine, but what if something is going wrong, and you can't work out where the error in the code is? This article will introduce you to some tools that can help you.

Assessments

The following assessments will test your understanding of the HTML basics covered in the guides above.

Marking up a letter

We all learn to write a letter sooner or later; it is also a useful example to test out our text formatting skills! So in this assessment you'll be given a letter to mark up.

Structuring a page of content

This assessment tests your ability to use HTML to structure a simple page of content, containing a header, footer, navigation menu, main content, and sidebar.

UNIT-2

RESOURCES FOR TEACHING COMPUTER SCIENCE

A) TEXT BOOKS – QUALITIES OF GOOD COMPUTER SCIENCE TEXT BOOK

Text book plays a pivotal role and occupies an important place in educating the children. It is an essential aid in teachinglearning process. Text book are backbone of the educational system.

There are the storehouses of the knowledge. These provide the content in an organized and systematic manner. These set the boundaries of the teaching learning process. There are some qualities of books are follows :-

1. Follow Aim and objectives

2. Based on prescribed syllabus

3. Authentic and adequate Subject Matter

4. Simple and Clear Language

5. Up to date Subject

6. Principle of Correlation

7. Psychological Approach of Subject matter

8. Logical Approach

9. Simple and Short Sentence

10. Appropriate Vocabulary

11. Correct spelling

12. Grammatically Correct Language

B) ROLE OF TEXT BOOK IN TEACHING COMPUTER SCIENCE

1. AS a Guide

2. Delimits boundaries of the content

3. Helpful for the Teacher

4. Helpful of Students

5. Cheapest and reliable

6. Specifies standards

7. Economical

8. Supplements to class work

C) CRITERIA FOR EVALUATION OF COMPUTER SCIENCE TEXT BOOK

The critical analysis of science textbooks is vital in improving teaching and learning at all levels in the subject, and this volume sets out a range of academic perspectives on how that analysis should be done. Each chapter focuses on an aspect of science textbook appraisal, with coverage of everything from theoretical and philosophical underpinnings, methodological issues, and conceptual frameworks for critical analysis, to practical techniques for evaluation.

Contributions from many of the most distinguished scholars in the field give this collection its sure-footed contemporary relevance, reflecting the international standards of UNESCO as well as leading research organizations such as the American Association for the Advancement of Science (whose Project 2061 is an influential waypoint in developing protocols for textbook analysis). Thus the book shows how to gauge aspects of textbooks such as their treatment of controversial issues, graphical depictions, scientific historiography, vocabulary usage, accuracy, and readability. The content also covers broader social themes such as the portrayal of women and minorities.

"Despite newer, more active pedagogies, textbooks continue to have a strong presence in classrooms and to embody students' socio-historical inheritance in science. Despite their ubiquitous presence, they have received relatively little on-going empirical study. It is imperative that we understand how textbooks influence science learning. This book presents a welcome and much needed analysis."

D) COMPUTER SCIENCE LIBRARY – MEANING, ORGANIZATION AND IMPORTANCE

E) COMPUTER SCIENCE LAB – NEED FOR PLANNING THE COMPUTER LABORATORY

UNIT-3: EXTENDED CURRICULAR ACTIVITIES

A) COMPUTER SCIENCE CLUB-MEANING, OBJECTIVES, ORGANIZATION, ACTIVITIES & IMPORTANCE;

1) The Club contains many notes and books that can be borrowed from club library
2) First priority to seats for field trips (to IT related companies and departments)
3) Opens opportunities to work experience in part-time summer jobs
4) Study groups
5) Special discounts to certain Institutions
6) Receive up-to-date club news.

7) Online discussion board on Topics and Subjects taken in Computer Science

COMMITTEES:

* Executive Committee consists of
- Head of department: Bears responsibility for the club
- Two faculty members from the computer science department: generally provides recommendation for potential club activities.

Club supervisor: An active member of the club and direct manager of club activities.
- Treasurer: Responsible for financial balance of the club

* Activity Committee: consists of a coordinator and a number of active members in charge of club activities such as exhibitions, trips, contests, etc.

* Advertisement and Information Committee: Consists of a coordinator and a number of active members in charge of advertisement and publicity of club also in charge of producing a yearly magazine and maintaining Club Website.

B) COMPUTER SCIENCE QUIZ

Questions and Answers

1.A means of compressing images by blurring the boundaries between different colors while maintaining all brightness information

A.JPEG

B.LZW

C.MIDI

D.GIF

2.Which of the following storage systems is best suited for storing and retrieving long strings of data that are processed in their sequential order?

A.Magnetic disk

B.Main memory

C.Optical CDs and DVDs

3.Which of the following is the binary representation of 4 5/8?

A.110.101

B.100.101

C.10.011

D.100.11

4.Which of the following bit patterns represents the value 5 in two’s complement notation?

A.11111011

B.00000101

C.11110011

D.00011010

5.A segment of a track in a mass storage system

A.Pixel

B.Address

C.Sector

D.Flip-flop

COMPUTER SCIENCE EXHIBITION

Computer Science is the scientific study of computers and their usage for computation, systems control, advanced algorithmic properties, artificial intelligence, data processing, and programming. Including theory, design, and analysis, computer science is the study of theoretical foundations and computation in computer systems.

All projects

1. Caffeine And Typing

To determine if the effects of a caffeine stimulant has any impact on typing speed.

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1. Computer Passwords

To determine the strength of several different computer passwords. At the end of this experiment, you and your classmates will have an understanding of what factors make weak computer passwords and which types of passwords are stronger.

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1. Font and Memory

To determine whether a serif font, such as Times New Roman or a sans serif font, such as Arial is more easily remembered.

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1. Information and CD's

To find out how much information is stored on a compact disc without using a computer.

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1. Optical Mice

To determine whether an optical mouse performs on a black surface.

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1. Search Engines

To determine which search engine is the most popular and why.

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1. Temperature and CPUs

To determine whether extreme temperatures (both hot and cold) affect how well a computer performs given tasks.

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1. Typing and Speed

To determine whether programs designed to improve typing speed, skill and accuracy are truly beneficial.

COMPUTER SCIENCE FAIR

if you're interested in learning about computer programming and computer science, we have some great science fair project ideas to get you started. For programming, we have a series of science fair project ideas based on JavaScript that offer a great way to get started with programming, using just a Web browser and a text editor. We also have science fair project ideas about file compression, a cool Geometry Applet that you can use to make interactive diagrams, and many more ideas to get you started.

C) QUALITY IMPROVEMENT: PROGRAMS FOR QUALITY IMPROVEMENT IN TEACHING COMPUTER SCIENCE

The SSA has consciously focused on the use of Information and Communication Technology (ICT) and Computer-aided Learning (CAL) to enhance the quality of classroom transactions. The "Innovation" head in the program budgets (Rs.15 lakh per year per district) has been covering, partially, the ICT and CAL interventions of various states. These interventions incorporategood examples of private-public partnerships, with NGOs supporting education, ICT/CAL vendorsand the state entering into collaborative arrangementsto develop relevant software and upgrade education.

d) PROFESSIONAL COMPETENCIES OF COMPUTER SCIENCE TEACHER.

1. The ability to use the basic steps in algorithmic problem-solving to design solutions (e.g., problem statement and exploration, examination of sample instances, design, implementing a solution, testing, evaluation).
2. The ability to evaluate ways that different algorithms may be used to solve the same problem.
3. The ability to describe the process of parallelization as it relates to problem solving, including describing the concept of parallel processing as a strategy to solve large problems.
4. The ability to use the process of order of operations, integer division, and mod.
5. The ability to define an algorithm as a sequence of instructions that can be processed by a computer and to demonstrate an understanding of the basic characteristics uses, and practical applications of algorithms by:
6. Acting out searching and sorting algorithms.
7. Explaining how sequence, selection, iteration, and recursion are building blocks of algorithms.
8. Explaining the value of heuristic algorithms to approximate solutions for intractable problems.
9. Critically examining classical algorithms and implement an original algorithm.
10. Evaluating algorithms by their efficiency, correctness, and clarity.
11. The ability to describe and analyze a sequence of instructions being followed (e.g., describe a character's behavior in a video game as driven by rules and algorithms).
12. The ability to represent data in a variety of ways including text, sounds, pictures, and numbers.

1. The ability to use visual representations of problem states, structures, and data (e.g., graphs, charts, network diagrams, flowcharts).

UNIT-4

EVALUATION IN COMPUTER SCIENCE

E-EVALUATION – MEANING AND PROCEDURE.

Educational evaluation is the evaluation process of characterizing and appraising some aspect/s of an educational process. There are two common purposes in educational evaluation which are, at times, in conflict with one another. Educational institutions usually require evaluation data to demonstrate effectiveness to funders and other stakeholders, and to provide a measure of performance for marketing purposes. Educational evaluation is also a professional activity that individual educators need to undertake if they intend to continuously review and enhance the learning they are endeavoring to facilitate.

a critical appraisal or assessment; a judgment of the value, worth, character, or effectiveness of something; measurement of progress. A broad view of evaluation in health care includes three approaches, directed toward structure, process, and outcome, depending on the focus of evaluation and the criteria or standards being used.

Structure evaluations are concerned with physical facilities ,equipment, staffing,and other characteristics of the facility or agency that have an effect on the quality of care being provided. *Process evaluations* center on the activities of the provider and what the provider has done to assess,plan,an dimplement nursing care.The criteria used in process evaluations in nursing are the Standards of Nursing Practice developed by the American Nurses 'Association .Structure and process evaluation sare primarily concerned with quality assurance and nursing audits.

Criterion-referenced evaluation evaluation of performance by judging an individual's behavior, performance, or knowledge against specific criteria or standards.

formative evaluation evaluation that involves feedback regarding progress being made; it involves the continuous gathering of evaluative data throughout a learning experience. **Normative-referenced evaluation** in which the scores of an individual are interpreted in light of the norm or distribution of scores of others taking the same test; progress is determined by how well the individual compares with peers.

outcome evaluation

process evaluation see

product evaluation in the nursing interventions classification, a nursing intervention defined as determining the effectiveness of new products or equipment.

structure evaluation see evaluation.

summative evaluation evaluation that involves one statement of the extent of achievement of objectives or goals; it involves the gathering of evaluative data at the end of a learning experience.