**Course: Advanced Bioinformatics**

**Module title: Networks**

**Module no. : 15**

**Networks: Introduction and basic concepts**

In the world we see disparate group of specialists with expertise in several domains but it is not possible for one individual to be perfect in all the matters. To solve daily life problems and activities, users have a grouping concept in which persons with different expertise provide their inputs to make the society a better place to live. This is also true for computing devices. We come across special needs for different groups both in social and digital lives. Data sharing and knowledge updating are the two main advantages of networking.

Need for connecting to internet: Following devices are required for connecting to the internet.

**Host machine:** Which can connect to the network. It may be a computer, PDA, mobile device in our home.

**Internet Provider:** An account with an ISP. Commonly, PTCL provides this option. Similarly, we have cable net providers or mobile phone companies.

**Connecting Device:** A modem for dial-up services. NIC for DSL/Cable services. Wi-fi devices are commonly used in mobiles laptops and computers.

Network Connection Types:

* **LAN:**A network of computers that are in the same physical location, such as home or building usually connected using Ethernet
* **WLAN** (wireless LAN): Wi-Fi (Wireless Fidelity) wireless local area network (WLAN) is a wireless computer network that links two or more devices using a wireless distribution method (often spread-spectrum or OFDM radio) within a limited area such as a home, school, computer laboratory, or office building. This gives users the ability to move around within a local coverage area and still be connected to the network, and can provide a connection to the wider Internet. Wireless LANs have become popular in the home due to ease of installation and use, and in commercial complexes offering wireless access to their customers; often for free.
* **Dial-up Services:** Dial-up Internet access is a form of Internet access that uses the facilities of the public switched telephone network (PSTN) to establish a connection to an Internet service provider (ISP) by dialing a telephone number on a conventional telephone line. The user's computer or router uses an attached modem to encode and decode information into and from audio frequency signals, respectively. Despite the proliferation of high-speed Internet access (broadband), dial-up Internet access may be used where other forms are not available or the cost is too high, such as in some rural or remote areas.

There are two options for connecting to internet.

Modem: **Mo**dulator/**dem**odulator

ISDN: Integrated Services Digital Network

* **Broadband Services:** A technology that provides digital data transmission over unused frequencies on traditional telephone. The ideal telecommunication network has the following characteristics: broadband, multi-media, multi-point, multi-rate and economical implementation for a diversity of services (multi-services). The Broadband Integrated Services Digital Network (B-ISDN) intended to provide these characteristics.
* **WAN (Wide Area Network):** A LAN spans a large geographic area, such as Connections between cities, telecommunication Lines. Fiber Optics cables are used for working of WANs.