Computer Networks (IT 3001)

Prof. Amit Jha

School of Electronics Engineering

KIIT University, Bhubaneswar

Syllabus

- **Go through the attachments uploaded on the website.**

Course Materials

- ***Text Book:***

1. COMPUTER NETWORKS: A Top-Down Approach by Behrouz A Forouzan, Firouz Mosharraf

- ***Reference Book:***

1. Computer Networks 5th edition by Tannenbaum
2. Computer networks An Open source approach by Ying-Dar Lin
3. Computer Networks A systems approach by Peterson and Daive
4. Computer Networking: A top-down approach by Kurose and Ross

Marking Schemes

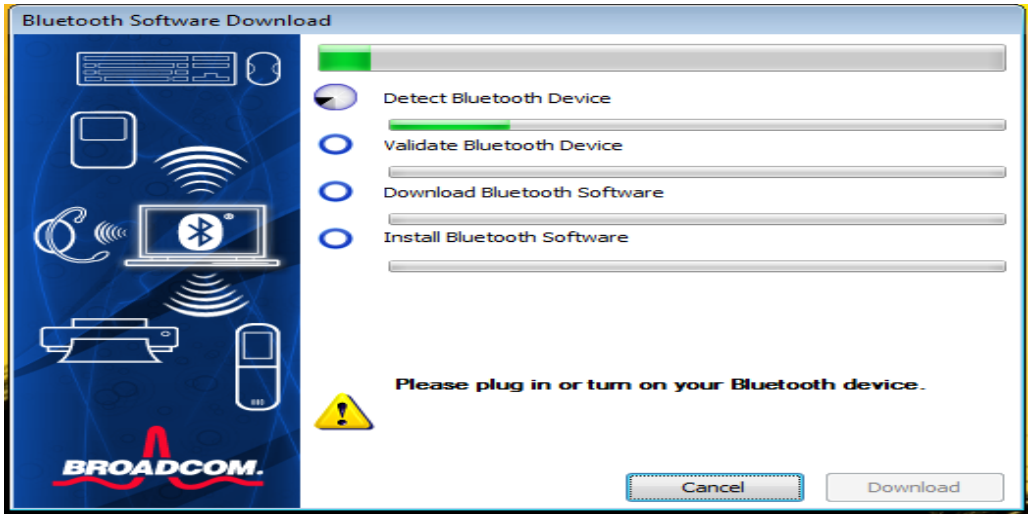
2 Quizzes, 4 Assignments and 1 Activity Based Learning	Mid-Sem	End-Sem
30	20	50

- If attendance <75% **Debar**
- **No assignments will be accepted beyond the due date**
- ***Notebook maintenance is mandatory.***

Motivation for the Course

- Three main reasons for studying computer networking
- **1. You don't have to be a math wiz:** Networking starts with basic logic and connections, only needs interests!!!
- **2. Every workplace needs a few friendly geeks:** Networking skills give you an edge and an opportunity to make a career in almost any sector you can imagine: financial services, education, transportation, manufacturing, oil and gas, mining and minerals, technology, government, hospitality, health care, retail… you name it.
- **3. Opportunities abound:** Some well known companies

Well known Firms



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NETWORKS

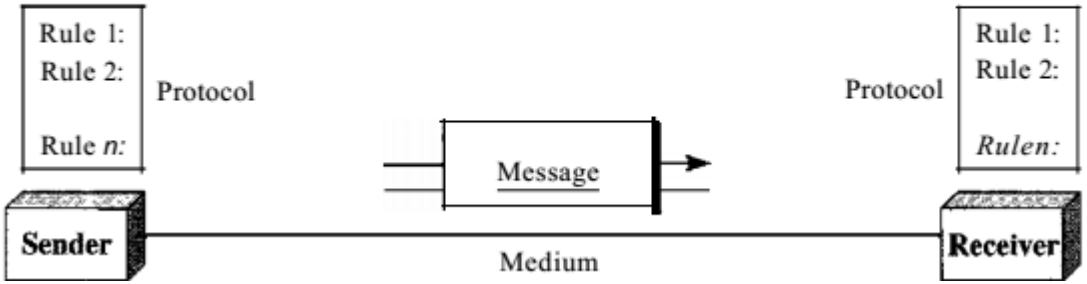
D-Link
Building Networks For People

Why to take this course seriously?

- Cisco Certified Network Associate CCNA
- Cisco Certified Network Professional CCNP
- Juniper Networks Certified Internet Associate JNCIA
- Comptia Network+

What is CN and why needed?

- **Computer Networking:** The process by which two computers from same or different manufacturers are communicated is called Computer Networking.



5 Components of Networking

Understanding of CN is needed in order to connect multiple computers together so that data can be exchanged among themselves reliably.

What is protocol and why it is needed? Protocol is set of rules necessary to communicate the data between two devices from different manufacturers.
E.g. A Sony Vio laptop can use processor from intel, Qualcomm, AMD, etc.

Data flow types

Simplex: Unidirectional communication like one way street.
Half-Duplex: Both directional but not at the same time.
Full-duplex: Both directional and at the same time like two way road.

Challenges in Computer Networking

- Data format and size, and from what type of sensors or equipment;
- How often the data needs to be transmitted;
- The transmission environment and overall distance it has to travel
- The type(s) of terrain and foliage the signal will encounter;
- The data communication protocol used;
- Available radio frequency choices available for each site and the related signal strength;
- Selecting the optimal combination of radios and antennas;
- The position and mounting of the antennas.

- Do we cover all these in this course?

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- NO…….

- We deal with only “the networking parts, protocols and standards”

What is Internet?

Internet is a collection of networks or network of networks. Various networks such as LAN and WAN connected through suitable hardware and software to work in a seamless manner. It allows various applications such as e-mail, file transfer, remote login, World Wide Web, Multimedia, etc run across the internet.

The Internet Today

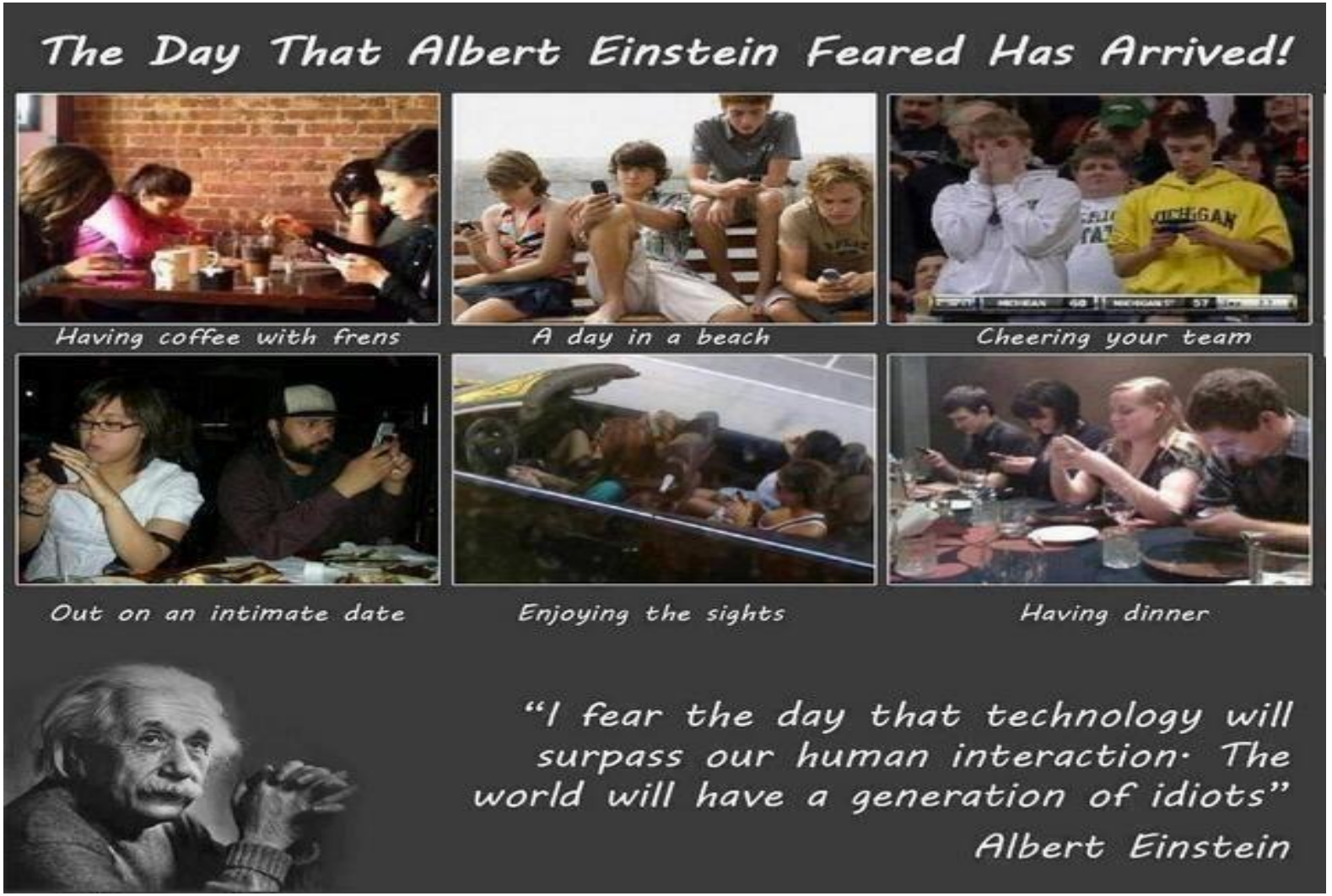
- Born in 1960 and has come a long way since then.
- Today run by private companies, not the government.
- Internet service provider (ISP) is backbone which provides the internet to end user.
- Number of people using it approx. 42.4% of total world population (world population more than 7 billion till march 2012)

Advantages of the Internet

Voice over IP, Video on demand, Network for the people, Commercial, Scientific and technical computing, Teleconferencing , Electronic mail, Electronic Data Interchange, Information Services, Marketing & Sales, Financial Services, Manufacturing , Directory services

It has everything for everyone and everywhere !!!!!!!!

Some bad results of the Internet



Communication System

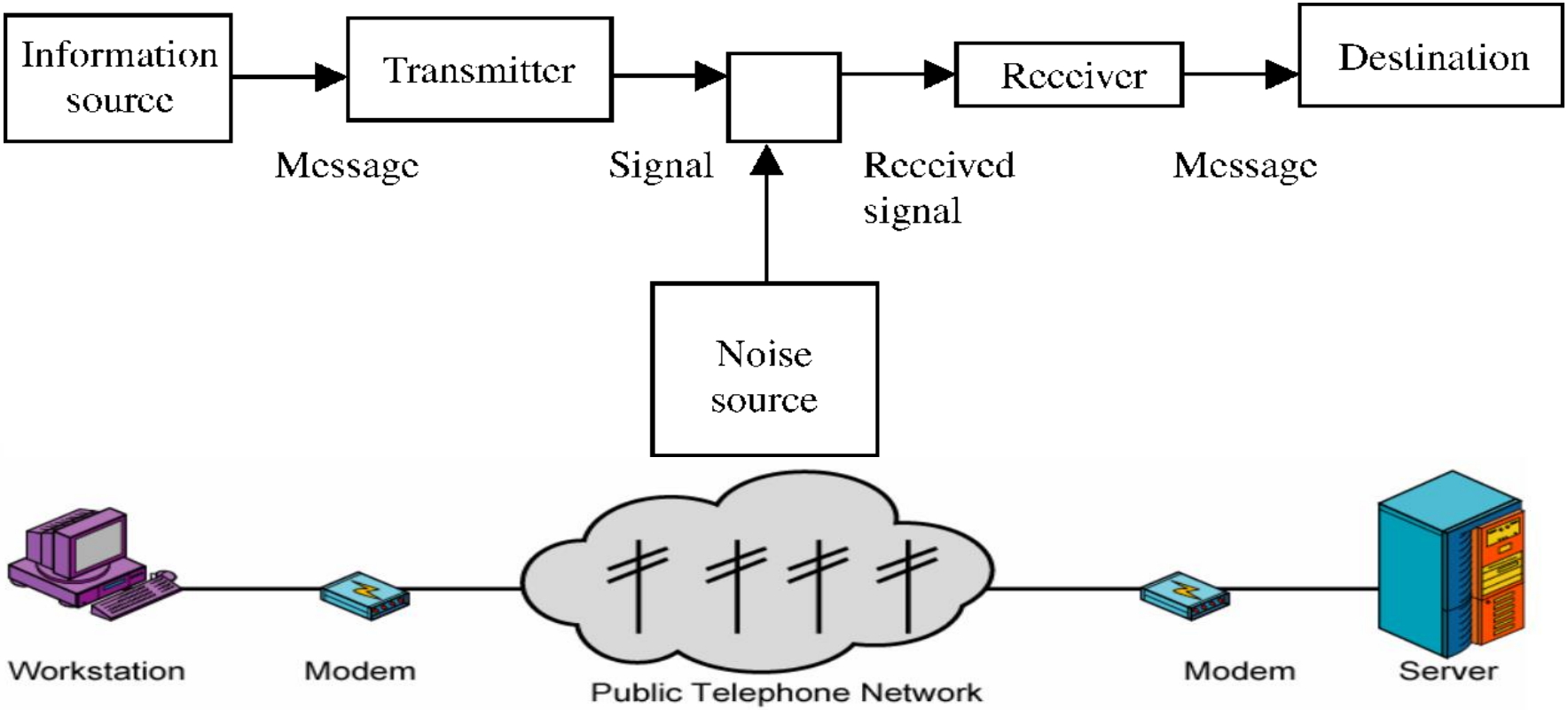
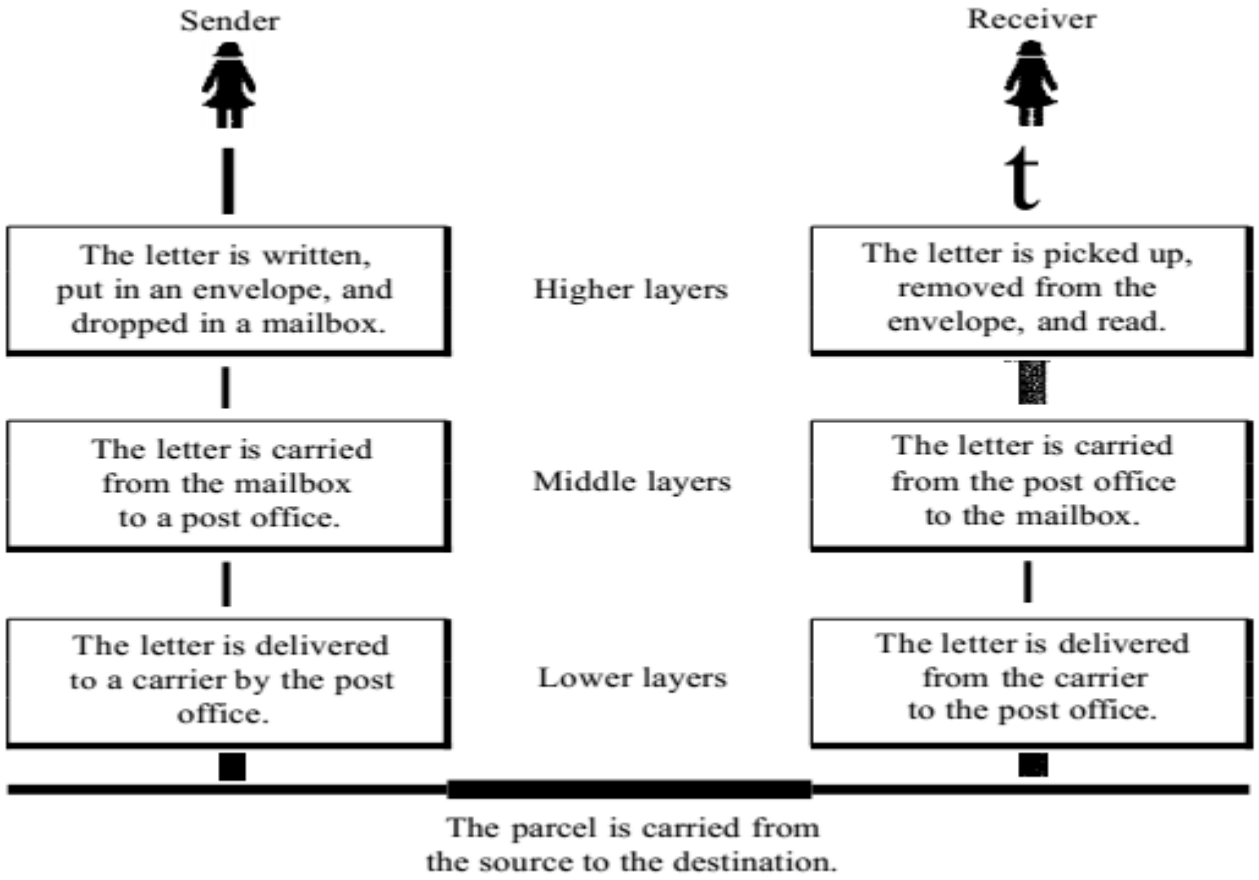


Figure 1.1 Simplified Communications Model

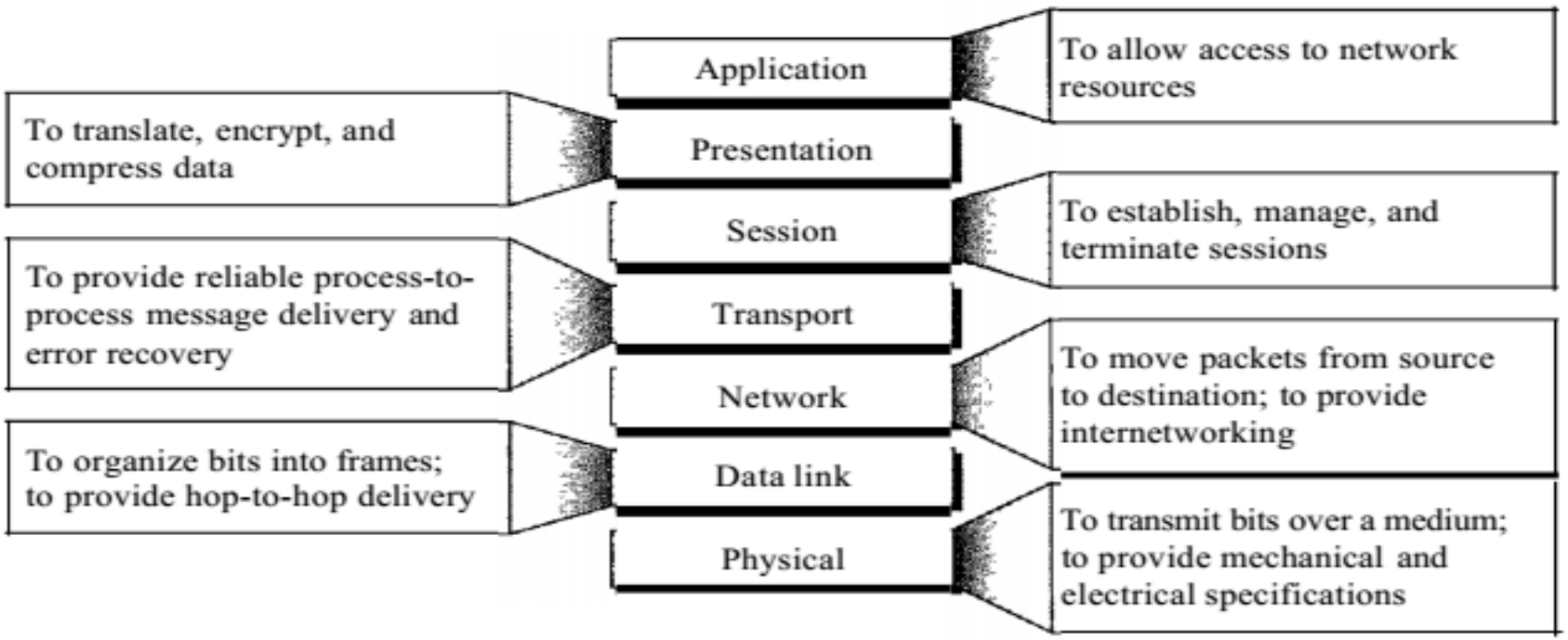
Layered Approach: What & Why?



OSI model

- OSI stands for open system for interconnection. It is a proposed model.
- It is not a protocol; it is a model for understanding and designing a network architecture that is flexible, robust, and interoperable.
- It has 7 layers.

Functions of each layer



TCP/IP Protocol Suite

- Stands for Transmission Control Protocol/ Internet Protocol. It is implemented model and designed prior to OSI.