Network & Telecom Skills

Description

Data transmission is an essential part of today's digital world. This course will focus on the fundamental concepts of Network and its underlying layered architecture that allows multiple parties to communicate online. You will learn the operational functions of packet handling, routing protocols, media transmission, application layer protocols and other general principles of security.

Learning Objectives

- Understanding basic Network types & underlying layered architecture.
- Network packet handling and routing.
- Transmission medium and other application layer protocols.
- Basic principles of network and online security.

Course Schedule and Contents

Session 1

- Primer
  - Network types & topologies
  - Network architecture
  - TCP/IP model architecture
  - Layered network architecture
  - Transmission mode
- Packet handling
  - Circuit switching vs packet switching
  - Packet switching approaches
  - Comparing switching types
- IGP vs. EGP
  - IGP & EGP
  - BGP
  - BGP security

Session 2

- OSPF
  - OSPF operations
  - OSPF link cost factors
  - Shortest path algorithm (Dijkstra)
  - OSPF Router types
  - OSPF Sub-divided networks & TE
- NAT
  - NAT Types
  - One-to-Many NAT
- RPC
  - RPC Request & response
- Practical Work

Session 3	▪ Optical Networks (ON) o Types of ON o Why do we need ON? ▪ File transfer protocol (FTP) o FTP connection modes o FTP data transfer modes ▪ Simple mail transfer protocol (SMTP) o SMTP & email structure o Working & limitations o Security concerns ▪ HTTP o Client-server setting o Stateless o Advantages & limitations
Session 4	▪ HTTPS o Port & structuring o HTTP & SSL/TLS o SSL/TLS in X509 o Limitations ▪ Security and protection o Top ranking internet attacks o Botnet o Zero-day vulnerability o Lack of breach/attack reporting ▪ Final Quiz

Grading

Class attendance: 10%

Class participation: 10%

Class assignment (practical work): 30%

Final Quiz: 50%

Policies

- Attendance in every class is expected.
- Class participation and discussion is strongly encouraged – and could award you bonus points.
- I expect you to take notes and ask questions (feel free to interrupt me if any subject topic is unclear).
- I expect you to turn-in your assignments on time to receive proper credits/grades.
- Any work submitted must be your own.
- I expect everyone to contribute equally to group assignments.
- Late work will not be accepted unless prior notification(s) with adequate reasoning has been made.

Good Luck!