**STUDY MATERIALS AND REFERENCE BOOKS:**

**Lectures posted on Moodle**

<https://moodle.cs.utcluj.ro/> -> *Rețele de calculatoare / Computer Networks, Sem. 2, 2023/2024*

and **books**

Vasile Teodor Dadarlat, Emil Cebuc: *Retele Locale de Calculatoare - de la cablare la interconectare,* Editura Albastra (MicroInformatica), 2005

W. Stallings – *Data and Computer Communications*, Prentice Hall (10th edition 2013)

A. Tanenbaum – *Computer Networks,* Prentice Hall, 2005 (Tradusa in limba romana: A. Tanenbaum – *Retele de Calculatoare, editia a 4a,* Byblos, 2004)

**TOPICS:**

|  |  |
| --- | --- |
|  | ISO/OSI Reference Model  TCP/IP Reference Model |
|  | Network Topologies |
|  | Hypertext Transfer Protocol (HTTP) |
|  | Electronic mail,  Simple Mail Transfer Protocol (SMTP),  Multi-purpose Internet Mail Extension (MIME) |
|  | Domain Name System (DNS) |
|  | Transmission Control Protocol (TCP)  User Datagram Protocol (UDP) |
|  | IPv4, ICMP |
|  | IPv6 |
|  | Flow Control Techniques:  Stop and Wait  Sliding Window |
|  | HDLC (High-level Data Link Control) protocol and frame structure; |
|  | CSMA/CD  FDDI |
|  | FastEthernet, GigabitEthernet, 10 GigabitEthernet and 100 GigabitEthernet |
|  | Wireless LAN, CSMA/CA access |
|  | Spanning-Tree protocol |
|  | Routing strategies |
|  | Nyquist theorem and Shannon’s theorem  Time Division Multiplexing TDM  Frequency Division Multiplexing FDM  Wavelength division multiplexing WDM  Synchronous transmission vs Asynchronous transmission  Switching techniques: circuit, message, packet switching |
|  | Transmission Media: twisted pair cables (TP) and fiber optics  Media for Wireless transmissions ; spread spectrum  Structured Cabling – necessity and elements |
|  | ADSL (Asymmetric Digital Subscriber Line) |

**Terms and concepts (short definitions):**

Claude Shannon’s model of communication

Symmetric vs asymmetric communication

Data Encapsulation, Data Segmentation (fragmentation), Data Reassembly

LAN, MAN, WAN

Symmetric vs asymmetric communication

Analog vs Digital data

Role and examples of Data encoding

Hub, Switch, Router

Bit stuffing role and necessity (example on HDLC protocol)

Transmissions of data and control information; piggybacking method