Contents

1 Redes e Telecomunicações

1.1 Docentes

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1.2 Programa

1. Introduction:
   - Notion of telecommunications networks;
   - Circuit switching and packet switching networks;
   - Access, metropolitan and core networks;
   - Organization of the telecommunications functionalities in protocol layers: the OSI and TCP/IP models.
2. Data link layer:
   - Redes Ethernet.
   - Virtual LAN;
   - Access control to shared media;
   - Spanning-tree based routing.
   - Continuous and discrete time Markov chains;
   - Queuing systems.
3. Network layer, basic notions of IPv4 and IPv6:
   - IP protocol;
   - ICMP (Internet Control Message Protocol).
   - Public and private addressing;
   - ARP (Address Resolution Protocol).
   - Address allocation: DHCP and autoconfiguration
   - Name resolution;
4. Routing (routing protocols).
   - distance vector and link state (algorithms Dijkstra and Bellman Ford).
   - RIP, OSPF and BGP
   - Routing in packet switching networks: Kleinrock approximation.
5. Transport layer:
   - Notion of port;
   - Transport based on datagrams (UDP);

    - Session management, flow control and congestion control (TCP).
6. Application layer:
    - Client-server model;
    - TFTP, FTP, email and HTTP services;
    - Dynamic allocation of network information: DNS, NAT and NAPT.
7. Basic quality of service mechanisms for packet switching networks:
    - Scheduling algorithms;
    - Integrated Services and Differentiated Services architectures;
    - Traffic regulation.
    - RSVP
    - Circuit blocking probability (Erlang B)
8. Wireless networks
9. Physical Layer
    - Digital representation of information, communication channels
    - Modulation, detection and error correction
10. Security
    - Basic concepts
    - Symmetrical and Asymmetrical cryptography

1.3 Avaliação

- Teórica (65%)
    - 1 Exame (final)
    - OU 2 exames:
        * 1º teste (45%): 3 Abril
        * 2º teste (65%): Època de Exames
        * Nota mínima em cada teste: 7.0
- Prática (35%)
    - Guia prático 1: sem nota
    - Guia prático 2: mini-teste individual de escolha múltipla (25%): semana de 27 de Março (29 Março)
    - Guia prático 3 e 4: mini-teste individual de escolha múltipla (35%): semana de 22 de Maio (24 Maio)
    - Guia prático 5: Raltório Final do Mini-projeto (40%): Época de Exames

Nota mínima em ambas as componentes: 6.5