
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);

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- 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%): Época 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