SAPIENZA
UNIVERSITÀ DI ROMA

Network Infrastructures

A.A. 2020-2021
Profs. Francesca Cuomo
and Marco Polverini

About the course (1/2)

- Lecture Time
  - **Corso per MARR-MINR-TLC**
  - Giovedi 08:00-10:00 Aula 205, Marco Polo
  - Vanerdi 14:00-17:00 Aula 205, Marco Polo
  - **Corso per Cybersecurity**
  - Mercoledi 12:00-14:00 Aula 1 Castro Laurenziano
  - Venerdi 11:00-14:00 Aula 2 Castro Laurenziano

- Prerequisite
  - Fundamentals of digital communications
  - Basic Understanding of Computer Networking (including IP/TCP suite)
  - Linux OS
  - Programming in C/C++, Matlab

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About the course (2/2)

- Offered to:
  1. Cybersecurity
  2. Ingegneria Informatica (Computer Engineering)
  3. Artificial Intelligence and Robotics
  4. Ingegneria delle Comunicazioni
  5. Data Science

  – Need to have common basics: Recalls on fundamentals of digital communications and Computer Networking (including IP/TCP suite)

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Course description

- This course will develop fundamental concepts, protocols & architectures for the description of the current network infrastructures: specific attention will be given to the broadband and optical networking
- Broadband networking driven by the imminent convergence of telephony (voice), Internet (data), cable (video), and wireless networks.
- Fundamental issues will deal with telephone, IP (v4 and v6) networking, optical networks, wireless access, Quality of Service, Network Control and Security
- The technologies and network infrastructures presented in the course are: xDigital Subscriber Lines, Passive Optical Networks, Gigabit Ethernet, Long Term Evolution-Advanced, 5G, IKE-IPSec, Software Defined Networks.

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Issues

- Review on TCP/IP networks, LAN/MAN technologies
- Network architectures and functional areas
- Digital channels and switching hierarchies
- **Wired and wireless access networks**
  - Copper based broadband access networks
  - ADSL and VDSL, networking solution
  - Fiber based: PON and relevant extensions
  - Multihop/3G/4G wireless data
  - Wi-xx family
  - 4G cellular systems: LTE
  - Evolution towards 5G
- **Core network, security and network management**
  - IPv6
  - IKE IPsec
  - Network control and management (Software Defined Networks and OpenFlow)
  - Network Function Virtualization e Service Function Chaining
  - Segment Routing

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Reference material

- Class will be based on lecture slides and research papers on the topic
- Slides on the web site: https://sites.google.com/a/uniroma1.it/francescacuomo
- Some technical papers suggested by the teacher
- Some technical papers found by the students (you have to perform a short thesis and the relevant presentation to the class)!

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Google group and maling list

- We use a Course Mailing List based on a Google Group
- **Mailing list A.A. 2020/21**
- Gruppo Google Studenti MARR-MINR-TLC
- Gruppo Google Studenti CYBERSECURITY
- Note: Register with your institutional e-mail @studenti.uniroma1.it
- All the information and news during the course will be given in the mailing list.

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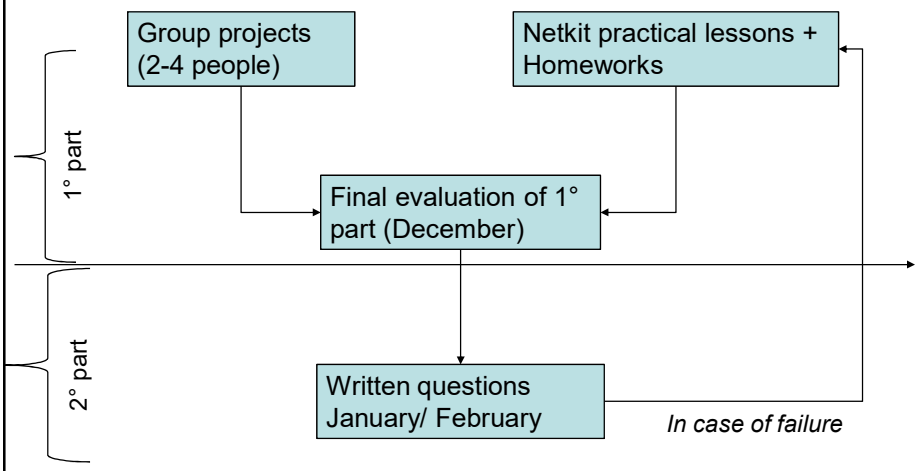
Exam



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Reference material

- Most communications will be handled by email and through the website
- Have your email address current – I will expect you to read emails about the class
- Course handouts and slides will be posted on website or shall be requested to the instructor via e-mail
- Research papers will be posted on the website

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Contacts

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