



SAPIENZA
UNIVERSITÀ DI ROMA

Network Infrastructures

A.A. 2018-2019
Prof. Francesca Cuomo



About the course (1/2)

- Lecture Time
 - **Corso per MARR-MINR-TLC**
 - Mercoledì 16:00-18:00 Aula 9 San Pietro Vincoli
 - Venerdì 14:00-16:00 Aula 41 San Pietro Vincoli (vicino mensa)
 - **Corso per Cybersecurity**
 - Martedì 8.30-10.30 Aula 8 Ingegneria via Castro Laurenziano
 - Mercoledì 10:30-13:00 Aula 7 Ingegneria via Castro Laurenziano
- Prerequisite
 - Fundamentals of digital communications
 - Basic Understanding of Computer Networking (including IP/TCP suite)
 - Linux OS
 - Programming in C/C++, Matlab



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)



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 networking, optical networks, wireless access, Quality of Service
- Convergence architectures: ATM, Internet, MPLS, WiMax and LTE-A, xDSL



Issues

- Review on Telephone networks, TCP/IP networks, LAN/MAN technologies
- Access network
 - Copper based broadband access networks
 - ADSL and VDSL, networking solutions
 - Fiber based: PON and relevant extensions
 - Free-space-optical network
 - Metro Ethernet/Gigabit Ethernet
 - Multihop/3G/4G wireless data
 - Wi-xx family (WiFi, WiMax and mesh networks)
 - Radio based: **LTE** and **5G**
- Core network
 - Optical networking concepts
 - Optical link layers (SONET, WDM)
 - Optical Transport Network based on DWDM: single link characterization, optical components and devices, systems and networks
 - GMPLS
 - High-speed switching & router-design
 - Quality of service (QoS) building blocks and architectures
 - Traffic engineering (MPLS, ATM)
 - Evolution of the control plane (SDN, **Openflow**)



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/dattica/network-infrastructures>
- 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)!

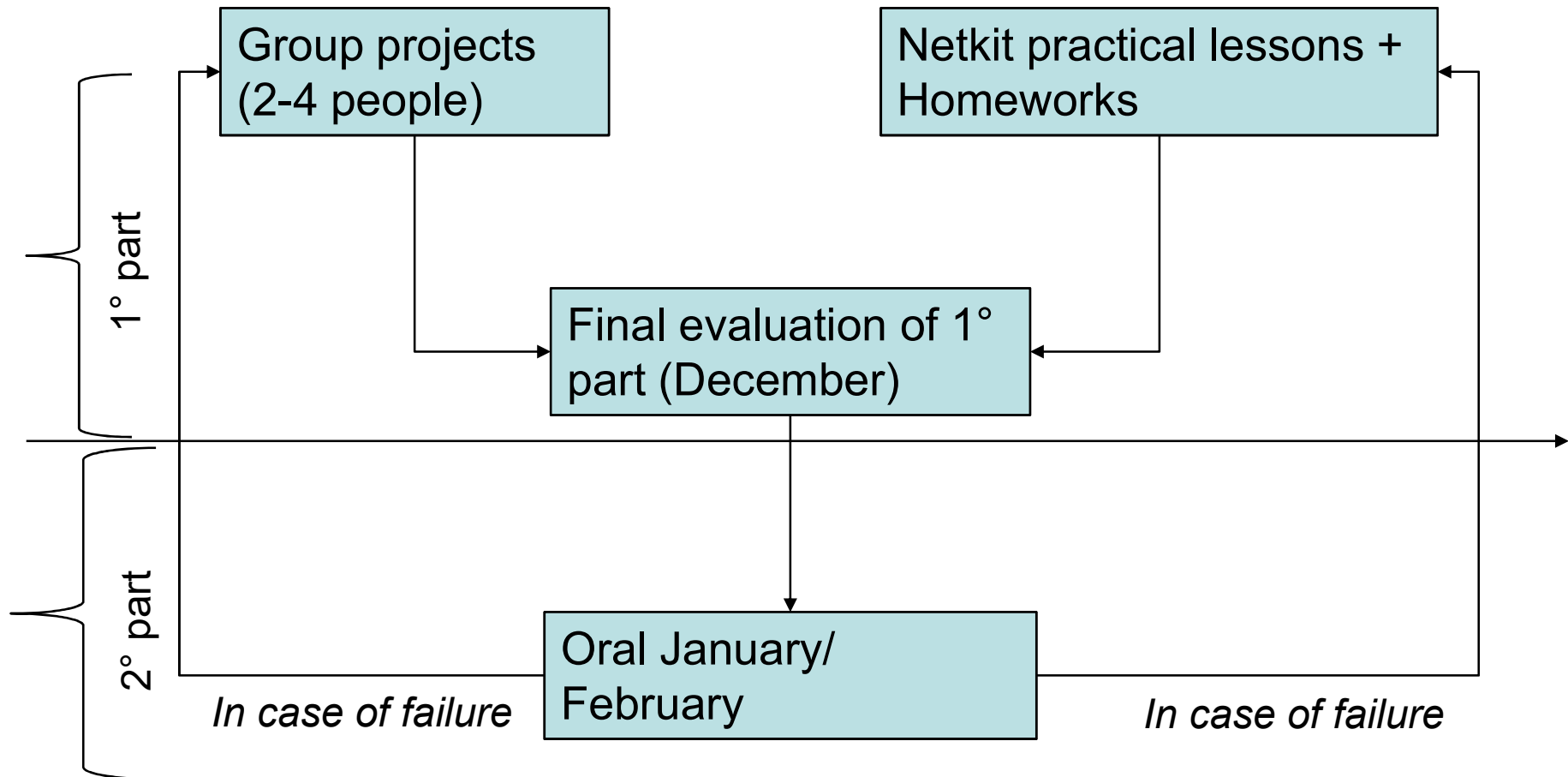


Google group and mailing list

- We use a Course Mailing List based on a Google Group
- **Mailing list A.A. 2018/19**
- Gruppo Google [Studenti MARR-MINR-TLC](#)
- Gruppo Google [Studenti CYBERSECURITY](#)
- All the information and news during the course will be given in the mailing list.



Exam





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



Contacts

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