# Networks and Technologies for Telecommunications (RTT) – 9 CFU

- Teacher(s):
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- Semester: 2

- Pre-requisites: Network management and Configuration (GCR)

- Area: Engineering, Group A (9 CFU)

# Syllabus

- **Network Management and Services (30 hours) – B. Martini**
  - What is Network Management and how it works in IP and transport networks
  - Management protocols (i.e., SNMP, NETCONF, CMIP)
  - Data modeling and data syntax languages (i.e., SMI, GDMO)
  - Exam: quiz

- **Lab of Network Software (25 hours) – A. Giorgetti**
  - Introduction to Software Defined Networking and OpenFlow protocol
  - Practical deployment of an SDN network emulated environment
  - Development (Java) of SDN application using ONOS controller, https://onosproject.org/
  - Exam: quiz and project

- **FPGAs for Communications Networks Prototyping (20 hours) - L. Valcarenghi**
  - What is an FPGA and what can be used for in communications networks
  - FPGA design: schematic-based flow, HDL-based flow, modular and incremental
  - Design Tools: simulation, synthesis, verification
  - Exam: project

# Theses available

- Advanced management solutions for Cloud Data Centers (SDN, NFV)

- Service composition and orchestration in 5G networks

- Transport Networks for 5G Mobile Radio System

- Energy efficiency in access networks

- Implementation of scheduler and switch controller with Field Programmable Gated Array (FPGA)

- ONOS application and driver development for optical networks

- Communication among ONOS controllers hierarchy

- Control of P4 networks using ONOS