Aims and learning outcomes
The course addresses the study of switching systems through a methodological approach. Fundamental concepts are first given with reference to internal architectures of routers and switches. The focus of the course is on the approaches and methodologies used to carry out the functions of switching and routing of traffic flows within these equipment. Algorithms are described aimed at accomplishing optimal implementation of routing tables and flow interconnection inside the equipment. Switching theory is developed to enable understanding of the different interconnection structures.

Syllabus
1 – Introduction

2 – Routing of IP datagrams

3 – Packet classification and traffic handling

4 – Interconnection networks

5 – Rearrangeable networks

6 – Non-blocking networks

7 – Fundamentals of packet switching
Classification of switching systems. Buffering strategies. Input queueing, output queueing, shared queueing.

8 – Scheduling in input-queueing switches
Prerequisites
None

Teaching activity
Lectures: 30 hours. Exercises: 20 hours. Project 10 hours

Bibliography
- Material distributed by the lecturer

Exams
The verification of knowledge for the course content consists in a test at the end of the course and in the completion of a project activity. The test comprises a written test and an oral examination on the subjects covered in the course. The experimental activity consists in a project either on the implementation of router functionalities through a NetFPGA board or in the development of a software simulator for the performance evaluation of a switch/router. In case of negative evaluation the student is admitted to the following tests of the academic year.

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