

COM-407

**TCP/IP networking**

Nikolopoulos Pavlos

Cursus	Sem.	Type
Communication systems minor	H	Opt.
Computer science	MA1, MA3	Obl.
Cyber security minor	H	Opt.
Cybersecurity	MA1, MA3	Obl.
Electrical and Electronical Engineering	MA1, MA3	Opt.
SC master EPFL	MA1, MA3	Obl.

Contact language	English
Credits	8
Session	Winter
Semester	Fall
Exam	Written
Workload	240h
Weeks	14
<b>Hours</b>	<b>6 weekly</b>
Lecture	2 weekly
Exercises	2 weekly
Practical work	2 weekly
<b>Number of positions</b>	

**Summary**

In the lectures you will learn and understand the main ideas that underlie and the way communication networks are built and run. In the labs you will exercise practical configurations.

**Content**

The TCP/IP architecture.

Layer 2 networking; Bridging.

The Internet protocol versions 4 and 6.

The transport layer, TCP, UDP, sockets, QUIC.

Link state routing, OSPF, Distance Vector routing. Interdomain routing, BGP.

Congestion control principles. Application to the Internet. The fairness of TCP. Tunnels and hybrid architectures.

**Keywords**

TCP/IP

Computer Networks

**Learning Prerequisites****Required courses**

A first programming course

**Recommended courses**

COM-208 Computer Networks

**Learning Outcomes**

By the end of the course, the student must be able to:

- Run and configure networks
- Understand the main ideas that underlie the Internet
- Write simple communicating programs
- Use communication primitives for internet and industrial applications.

**Transversal skills**

- Access and evaluate appropriate sources of information.
- Continue to work through difficulties or initial failure to find optimal solutions.

### Teaching methods

Lectures.  
Online quizzes.  
Labs on student's computer.

### Expected student activities

Participate in lectures  
Participate in online quizzes  
Make lab assignments (in the rule, every other week)

### Assessment methods

Theory grade = final exam  
Practice grade = average of labs  
Final grade = mean of theory grade (50%) and practice grade (50%).  
The research exercise may add a bonus of at most 0.5 points in 1-6 scale to the practice grade.

### Supervision

Office hours	Yes
Assistants	Yes
Forum	Yes

### Resources

#### Bibliography

"Computer Networking : Principles, Protocols and Practice", O. Bonaventure, open source textbook,  
<http://inl.info.ucl.ac.be/CNP3>

#### Ressources en bibliothèque

- [Computer Networking / Bonaventure](#)

#### Notes/Handbook

Slides are on moodle

#### Websites

- <http://moodle.epfl.ch/course/view.php?id=523>

#### Moodle Link

- <https://go.epfl.ch/COM-407>