

A cartoon illustration of Homer Simpson from 'The Simpsons' looking at a computer monitor. The monitor displays the text 'TO START PRESS ANY KEY' in green. The background shows a window with a blue sky and a yellow wall.

EPFL

TCP/IP Networking

Jean-Yves Le Boudec
2019

Understanding what's behind TCP/IP

Your Team

Lecturer: J.-Y. Le Boudec

Teaching Assistants

Marguerite Delcourt (head TA)

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Ludovic Thomas

Roman Rudnik

Whom is this course for ?

Master students in electricity, communication systems and computer science, all branches of engineering

Requirements

Experience with using one programming language

No prior knowledge of TCP/IP is required

We will practice with computers in a virtual environment – expect to spend time on your computer

The RAKE philosophy

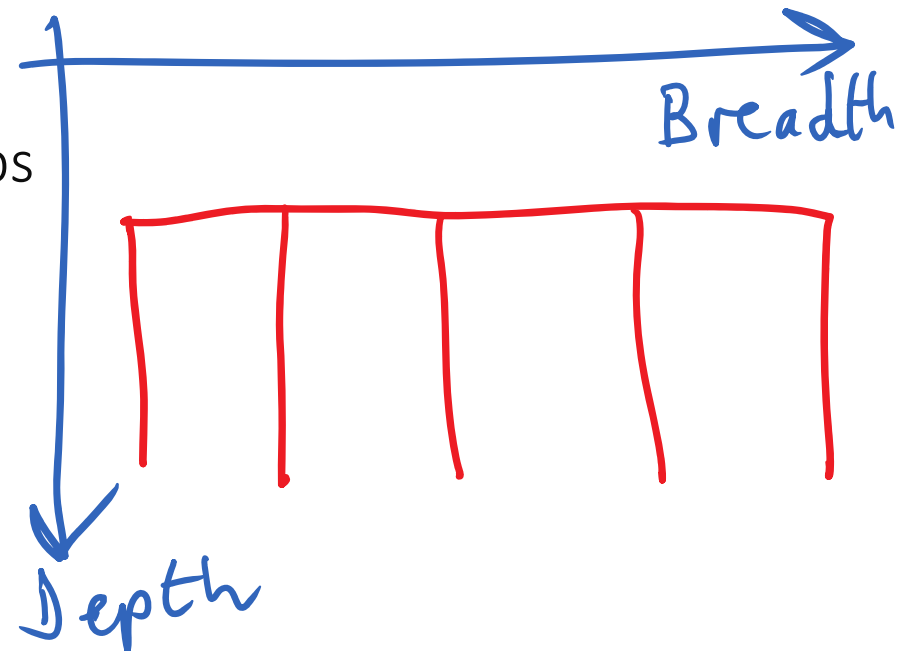


Viewpoint 1 :« I want this course to teach me all the details of all networking protocols »

Viewpoint 2: « TCP/IP is a mountain of details, I will learn when and if the need arises »

We will use the RAKE philosophy

- Depth by a few carefully selected labs
- Breadth by systematic concepts



What, Why, How

I will try and teach you to always ask first

Why was this stuff invented, what problem is it solving ?

What is it doing?

before asking:

How does it do its job ?

The why and what are short.

The how is long but can often be guessed once you understand the why and what.

Wikipedia is good at how, often less good at what and why

Organisation

Lecture: every Thursday 12:15-13:00

Test: every other Friday 11:15- 12:00 IN1 and 2

Labs: every Friday

11:15 – 13:00 INF 1 and 2 (later if test)

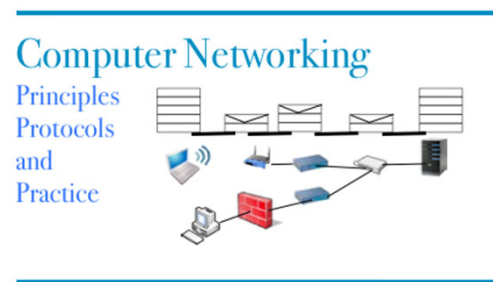
13:15 – 14:00 INM 202 and INF019

Final exam in exam session

See Moodle for all details and for roadmap.

Courseware

“Computer Networking : Principles, Protocols and Practice”
version 1 or 2, by O. Bonaventure, open source textbook,
<http://inl.info.ucl.ac.be/CNP3>



Rate adaptation, Congestion Control and Fairness: A Tutorial

JEAN-YVES LE BOUDEC
Ecole Polytechnique Fédérale de Lausanne (EPFL)

Module 2: “Rate adaptation, Congestion Control and Fairness: A Tutorial” by JY Le Boudec, on moodle and on the web http://ica1www.epfl.ch/PS_files/LEB3132.pdf



TCPIP Labs

Marguerite Delcourt



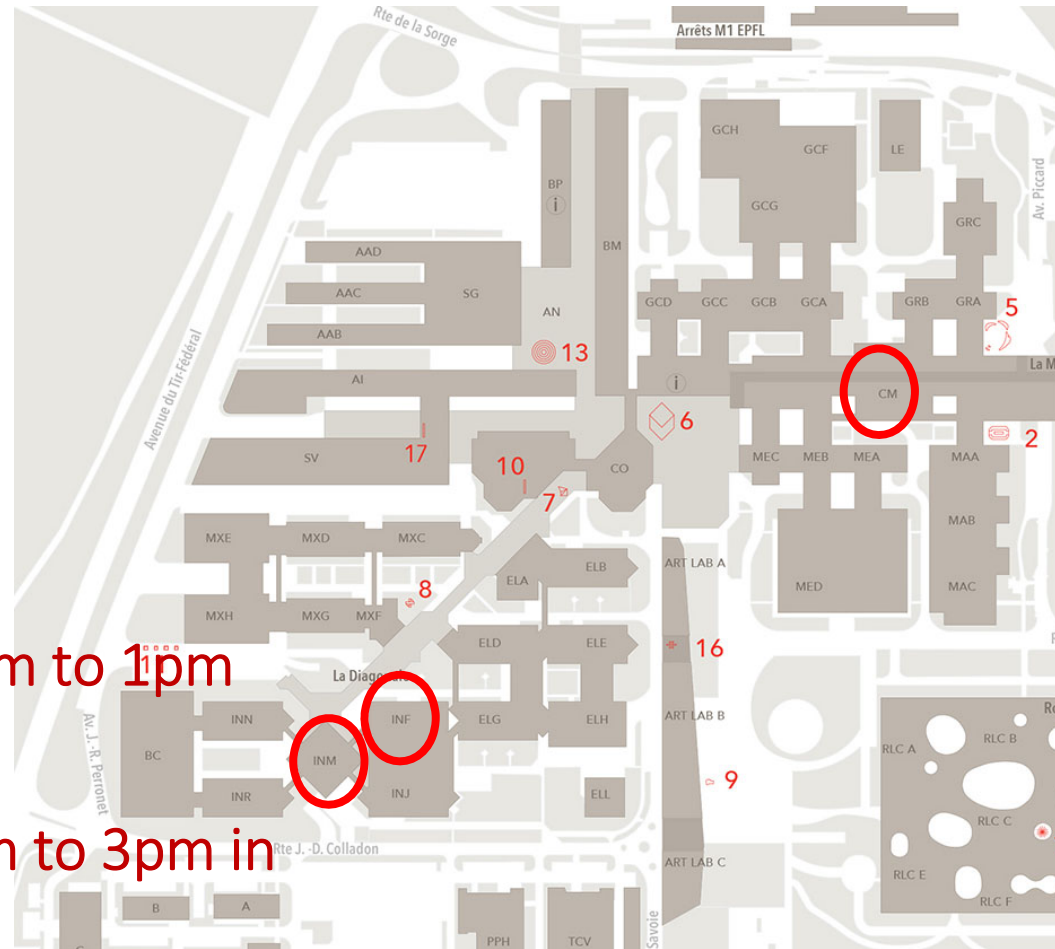
Labs

- 7 labs in total: from Lab 0 to Lab 6,
- they are mandatory and graded,
- you need your own laptop,
- you will work in pairs: only one report for two.

On Moodle

- You will find all info related to lectures and labs,
- the lab report consists of the filled-in pdf we provide (Adobe Reader XI supports saving pdf forms, not all readers do!),
- submit the report and the requested code on Moodle in the submit links that will be available in due time,
- typically, you will have almost two weeks per lab: beware of the set deadline, it is automatic!

Time and place



Lectures:
Thursdays
From
11:15am to
1pm in CM2

Labs: Fridays

- from 11:15am to 1pm
In INF1
- From 1:15pm to 3pm in
INM2020
- Sometimes INF019

Room INF019

- Internet Engineering Workshop room.
- May need it in Lab 2 or to work with the IPv6 Wi-Fi connection outside of the lab sessions.
- It has a lot of equipment so access is regulated.
- You must **go to Moodle and fill in the “Lab Rules Agreement”** before next Thursday: otherwise we cannot give you free access to the room with your Camipro card!
- Be respectful: keep the material in good state and put everything back after usage.
- Please report any suspicious activity in the lab room: we have logs of who entered..

First labs

- Lab 0 is an introduction, it is smaller than others, you can start it today or tomorrow in the lab session, it ends **next Wednesday (25th of September) at 23:55pm!**

Recommendation: finish it ASAP to gain time for Lab 1.

- Lab 1 and the others are longer, you have two weeks for them.

Recommendation: start them early, bugs happen all the time and you need to fix them in time!

- Some labs have a bonus research exercise, it is NOT mandatory but it is interesting to do them.

Organization: asking for help

- You can work on the labs whenever you like but TAs are here to help you during the Friday lab sessions.
- Two different TAs are in charge of each lab. They have deeper knowledge about it and will grade it but all TAs are here to help.
- We will do our best to help you but before you ask us, try to have an engineer's approach and search for a solution yourself: ask our good friend: Google!
- **Do not send us emails** about technical lab issues, post questions on the **Moodle forum**: we will only answer there and you can answer too! Maybe your question has already been answered there.

Don't expect us to answer outside of office hours, we will do our best but we are also humans!

Enjoy!



Tests

7 Tests (short quizzes)

INF1 and 2 on Fridays of even weeks

11:15-12:00 sharp

Program of test is: everything up to and including the lecture of the day before the test

Best 5 tests used for grading

No replacement if sick or other excuse

All tests are written, closed book, no electronic equipment

only one pen/pencil allowed on table



Please go to speakup.info or start
speakup app

Join room number written on board
and say in which case you are



- A. Computer Science
- B. Communication Systems
- C. Data Science
- D. Electrical Engineering, Smart Grid
- E. Electrical Engineering, other orientation
- F. Mechanical Engineering
- G. Maths
- H. Other Section

Please use speakup **ethically**
– don't abuse anonymity



Final Exam

One final exam in exam session

See last year's exams on moodle

All tests/exams are written, closed book, no electronic equipment

The “exam booklet” (available on moodle) is allowed – we print it for you.



Grading

$$\text{Theory Grade } T = \max(0.4C + 0.6F, F)$$

where C = test grade (average of best 5 tests)

F = final exam

Lab grade

$$L_i = \min(6, \text{raw lab grade} + \text{social influence bonus } (0.25))$$

$$L_{avg} = \frac{0.5L_0 + L_1 + \dots + L_6}{6.5} \quad (\text{lab0 counts as } \frac{1}{2} \text{ lab})$$

RE_{avg} = average of all bonuses (max bonus = 0.5 on scale 1-6)

$$L = \min(6, L_{avg} + RE_{avg})$$

Final grade

Final grade $G = \text{round}\left(\frac{T+L}{2}\right)$ where round is to the nearest quarter-integer.

All grades except G are non-rounded.

