Computer Networking & Distributed Applications (with project)

Subject area: Computer Science/ICT

University: L'X
Level: BA all years, MA1, MA2
Teaching mode: completely online, not time-specific
Instructor(s):   Thomas Heide Clausen

Short description

This course will introduce students to the architectures, theory and practice required for implementing communicating, Internet-connected, systems as well as provide them with the understanding of "how the Internet Works". The course will be available asynchronously, fully on-line, or on-side, through learning flows with videos, quizzes, homework, lab exercises and will be completed an independent project, allowing the student to demonstrate the ability to put into practice what they've learned.

Full description

During this course, your teaching staff will be accompanying you in discovering how to conceive, and construct, "networked systems", and will offer practical experiences in doing so.
That implies, of course, discovering how the net works (pun intended), what a protocol is, what a system is, and what the different acronyms that you might encounter really means: TCP/IP, SMTP, NAT, NATP, etc. It also implies writing programs which communicate over the Internet — who knows, maybe you will be getting the impulse to starting the next Google or FaceBook during this course?
This course will consist of 3 parallel activities, through which your teaching staff (which you can see to the right) will accompany you:
-Basic video modules, which introduce key technological concepts for conceiving network systems
-Lab Exercises, which will take you "from neophyte" to a competent networker, and which will teach you how to write communicating programs, and have them talk to each other across the Internet. \
-An independent project, allowing the student to demonstrate their ability to put into practice what they've learned
The key activities of the course will be as follows:
-Video modules and accompanying quizzes, which serve to provide an abstract "programmers overview of computer network principles and architectures", and will cover topics such as:
      How does the Net Work?
      Network Programming
      Network Configuration
      Components of a Computer Network
      The Domain Name System

NAT, NAPT, ...

…

-Lab Exercises, which serve to give you practical experiences in computer networking - in particular, but not exclusively, in how to write programs that communicate over the network. They will be of one of two distinct forms:

Tutorials serve to help you acquire a certain set of skills, in a very guided step-by-step fashion. This may be, for example, how to write a program that communicates over the network, or how to set up a small computer network.

Assignments are (graded) more independent and less guided activities, where you will be told what the end-result of your work should be, but not be given a step-by-step tutorial to follow. While you will be working independently, of course your teachers will be present to help you in your design, and implementation, of a communicating system. Assignments will be graded.

-The Final Exam is, in part, a way to evaluate what you have retained from the course, and will contribute to your final grade. However more significantly, it is also there to aid your revising of the course material, and thus to reinforce your learning process. The final exam will be a multiple-choice questionnaire, and will - in a nutshell - be a longer version of the quizzes that you have seen during the lab exercise sessions. Thus, if you've prepared continuously for the weekly quizzes, if you've done well in those, and you review the course material diligently, then you should be well prepared also for the final exam.

-The independent project, which allows you to demonstrate their ability to put into practice what you've learned - and your completion, and presentation, of this project will contribute significantly to your final grade.

Learning outcomes

The course will provide students with an abstract "programmers overview of computer network principles and architectures", and will cover topics such as:

    How does the Net Work?
    Network Programming
    Network Configuration
    Components of a Computer Network The Domain Name System

The lab exercises will, additionally, give students practical experiences in computer networking - in particular, but not exclusively, in how to independently conceive of, design, and write programs that communicate over the network, and the independent project will give students experience in conceiving of, designing, and implementing, real-world communicating systems.

General information

Contact hours per week:	6 hours
Total workload:	60 + personal work (in student hours for the whole course)
ECTS credits:	6
Language:	English

Course start date:	03 January 2023
Course end date:	03 June 2023
Add. info about start date:	Individualised, can be any date, between Jan 3 and April 1, 2023. Please note that the intended start-date must be communicated to Ecole Polytechnique at the time of registration. The course end date should be exactly 10 weeks after the start-date.
Weekly teaching day/time:	Available fully asynchronous
Time zone:	CET (Denmark, Germany, France, Netherlands, Switzerland, Czech Republic)
Further information:	Interested EuroTeQ students are welcome to, at any time, to come discuss their course choices in chat, or in visio, with the instructors from Ecole Polytechnique who will be teaching the classes. To this end, a dedicated WebEx space is permanently available here: https://eurl.io/#fCk0f6iWF.
Prerequisites:	Any "introduction to computer programming" course.
	Please note that the courses on Computer Networking & Distributed Applications with and without project are not compatible. EuroteQ student can not be enrolled in both courses.
Activities and methods:	The course will be available asynchronously, fully on-line, or on-side, through learning flows with short videos, quizzes, homework, lab exercises / tutorials — as well as office-hours via Webex with professors and instructors. While being asynchronous, each student is expected to check in with an instructor over Webex, weekly, following the chosen start-date.
Presence on campus:	no

Final examination

Form:	Individual project
Date:	
Location/format:	online
Re-sit possibility:	no
Transcript available:	end of the semester and generally 8 weeks after the exam.
Add. info/requirements:	

Registration

To register for this course, follow the registration requirements of your **home university** as specified here: www.euroteq.eu/courses-registration.

Administration

Number of places: 24-30

Minimum participants:

Internal course code:

Contact: euroteq-mobility@polytechnique.fr

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