UCLouvain

lsinc1341

2023

Computer networks

5.00 credits	30.0 h + 30.0 h	Q2

This learning unit is not open to incoming exchange students!

Language :	French
Place of the course	Charleroi
Prerequisites	This course assumes that the student already acquired programming skills, algorithmic skills and mastery of the elementary data structures targeted by the LEPL1402 course. Successful completion of LEPL1503 is a plus *The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.*
Main themes	• Role, model and needs of representative distributed applications • Reference model of computer networks • Reliable Transport of Information: Mechanisms and Protocols • Network interconnection, addressing, routing and related problems • Local, metropolitan and long distance networks
Learning outcomes	**At the end of this learning unit, the student is able to :** Given the learning outcomes of the "Bachelor in Engineering" program, this course contributes to the development, acquisition and evaluation of the following learning outcomes: • AA.1.1, AA.1.2 • AA2.5-7 • AA3.2 • AA4.1-4 Given the learning outcomes of the "Bachelor in Computer science" program, this course contributes to the development, acquisition and evaluation of the following learning outcomes: • S1.I7 • S2.2-4 • S4.3 • S5.2-5 • S6.2-3 Students who have successfully completed this course will be able to • Explain the communication needs of the different classes of distributed applications handling data or multimedia streams • Explain the distribution of functions that satisfy these needs in the different layers of the reference model • Explain the realization of these functions in Internet protocols • Choose solutions according to the needs of their application • Quantify the characteristic quantities involved in the networks Students will have developed methodological and operational skills. In particular, they have developed their ability to • Argue to highlight the positives and negatives of a solution and make suggestions for improvement; • Write a summary report containing the elements that we wish to highlight.
Evaluation methods	The assessment consists of four parts: • a group project on an implementation of the protocol worth 5 points out of 20 • an individual review of two group works, worth 1 out of 20 points • participation in inginious exercises each week, worth 1 point out of 20 points • the final exam, worth 13 out of 20 points Students who actively contribute to educational materials can earn bonus points. Reviews associated with the project and participation in inginious exercises can only be presented in the first session. In the second session, students who so wish can replace the five points associated with the group project with an individual work proposed at the beginning of July.

Teaching methods	The course combines lectures, supervised exercise sessions, group work and personal work.
Content	Basic principles of network operation (reliable transfers, routing, naming/addressing, resource sharing, basic notions of security, etc.) Analysis of the main protocols used on the Internet (HTTP, DNS, TLS, TCP, UDP, IP, OSPF, BGP, Ethernet, WiFi, ...)
Inline resources	https://www.computer-networking.info https://moodle.uclouvain.be/course/view.php?id=1269
Bibliography	Computer Networking: Principles, Protocols and Practice (3rd edition), https://beta.computer-networking.info
Other infos	Prerequisites: • high level programming language • Unix environment
Faculty or entity in charge	SINC

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Computer Science	SINC1BA	5		🔍