


**This learning unit is not open to incoming exchange students!**

Language :	French
Place of the course	Charleroi
Prerequisites	<p>This course assumes that the student already acquired programming skills, algorithmic skills and mastery of the elementary data structures targeted by the LEPL1402 course.</p> <p>Successful completion of LEPL1503 is a plus</p> <p><i>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.</i></p>
Main themes	<ul style="list-style-type: none"> <li>• Role, model and needs of representative distributed applications</li> <li>• Reference model of computer networks</li> <li>• Reliable Transport of Information: Mechanisms and Protocols</li> <li>• Network interconnection, addressing, routing and related problems</li> <li>• Local, metropolitan and long distance networks</li> </ul>
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <p>Given the learning outcomes of the "Bachelor in Engineering" program, this course contributes to the development, acquisition and evaluation of the following learning outcomes:</p> <ul style="list-style-type: none"> <li>• AA.1.1, AA.1.2</li> <li>• AA2.5-7</li> <li>• AA3.2</li> <li>• AA4.1-4</li> </ul> <p>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:</p> <ul style="list-style-type: none"> <li>• S1.17</li> <li>• S2.2-4</li> <li>• S4.3</li> <li>• S5.2-5</li> <li>• S6.2-3</li> </ul> <p>Students who have successfully completed this course will be able to</p> <ul style="list-style-type: none"> <li>• Explain the communication needs of the different classes of distributed applications handling data or multimedia streams</li> <li>• Explain the distribution of functions that satisfy these needs in the different layers of the reference model</li> <li>• Explain the realization of these functions in Internet protocols</li> <li>• Choose solutions according to the needs of their application</li> <li>• Quantify the characteristic quantities involved in the networks</li> </ul> <p>Students will have developed methodological and operational skills. In particular, they have developed their ability to</p> <ul style="list-style-type: none"> <li>• Argue to highlight the positives and negatives of a solution and make suggestions for improvement;</li> <li>• Write a summary report containing the elements that we wish to highlight.</li> </ul>
Evaluation methods	<p>The assessment consists of four parts:</p> <ul style="list-style-type: none"> <li>• a group project on an implementation of the protocol worth 5 points out of 20</li> <li>• an individual review of two group works, worth 1 out of 20 points</li> <li>• participation in ingenious exercises each week, worth 1 point out of 20 points</li> <li>• the final exam, worth 13 out of 20 points</li> </ul> <p>Students who actively contribute to educational materials can earn bonus points.</p> <p>Reviews associated with the project and participation in ingenious exercises can only be presented in the first session.</p> <p>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.</p>

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	<a href="https://www.computer-networking.info">https://www.computer-networking.info</a> <a href="https://moodle.uclouvain.be/course/view.php?id=1269">https://moodle.uclouvain.be/course/view.php?id=1269</a>
Bibliography	Computer Networking: Principles, Protocols and Practice (3rd edition), <a href="https://beta.computer-networking.info">https://beta.computer-networking.info</a>
Other infos	Prerequisites: <ul style="list-style-type: none"> <li>• high level programming language</li> <li>• Unix environment</li> </ul>
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		