

5.0 credits	30.0 h + 30.0 h	1q
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Teacher(s) :	Lugan Sébastien (compensates Macq Benoît) ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Inline resources:	<ul style="list-style-type: none"> - iCampus website, - online resources indicated on iCampus website.
Prerequisites :	None
Main themes :	<ul style="list-style-type: none"> - Introduction, media access control, layered models, - Internet Protocol, IP routing, introduction to IPv6, - DNS, e-mail, common protocols, - Multimedia networking (streaming, VoIP, DVB), - Network security and advanced topics.
Aims :	<ul style="list-style-type: none"> - AA1.1, AA1.2, AA1.3 ; - AA2.1, AA2.3, AA2.4 ; - AA5.1, AA5.2, AA5.3, AA5.5. <p>At the end of this lecture, the students will be able to:</p> <ul style="list-style-type: none"> - understand the architecture of communication networks, - identify the routing strategies which are best suited to a particular network topology, - understand resource management strategies allowing to guarantee a quality of service, particularly for multimedia communications, - design architectures allowing secure communications. <p>Transverse learning outcomes:</p> <ul style="list-style-type: none"> - use a network simulation tool (Netkit), - configure network parameters of a Linux based system using low-level commands, - configure a router using a (Cisco) IOS-like syntax. <p><i>The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".</i></p>
Evaluation methods :	<ul style="list-style-type: none"> - Lab report (20% of the final points), - Oral exam (80% of the final points), all documents allowed.
Teaching methods :	<ul style="list-style-type: none"> - Traditional lectures, - Labs in computer room allowing the student to use the theoretical concepts seen during the lecture on a simulated network (using Netkit simulation software).
Content :	<p>Part 1 (networking):</p> <ul style="list-style-type: none"> -- Introduction to communication networks, -- Media Access Control, Layered models, -- Internet Protocol, IP fragmentation, -- UDP, TCP, ICMP, traceroute & mp; PMTU discovery, -- Static IP routing, dynamic routing (algorithms and protocols), -- DNS, e-mail (SMTP, POP3, IMAP4), -- Common protocols (HTTP, FTP, etc.), -- NAT, introduction to IPv6. <p>Part 2 (multimedia/security):</p> <ul style="list-style-type: none"> -- Introduction to multimedia networking, -- Multimedia streaming (stored multimedia, live, real-time interactive),

	<p>-- Introduction to audio and video compression, -- Streaming protocols, -- VoIP (ToIP, video conferencing, SIP), -- Digital Video Broadcasting (DVB), -- Introduction to network security, principles of cryptography, -- Message integrity, digital signature, certification authorities, PKI, -- Secure e-mail and network connections (X.509, SSL).</p>
Bibliography :	<p>- Lecture notes, - James Kurose and Keith Ross, 'Computer Networking, A Top-Down Approach Featuring the Internet'.</p>
Other infos :	<p>Labs in computer room</p>
Cycle and year of study :	<p>> Master [120] in Chemistry and Bio-industries > Master [120] in Environmental Bioengineering > Master [120] in Electro-mechanical Engineering > Master [120] in Forests and Natural Areas Engineering > Master [120] in Agricultural Bioengineering > Master [120] in Electrical Engineering</p>
Faculty or entity in charge:	<p>ELEC</p>