ELEC2920 Communication networks

[30h+30h exercises] 5 credits

This course is taught in the 1st semester

Teacher(s): Benoît Macq
Language: French
Level: Second cycle

Aims

At the end of this course, the students will be able
- to understand several communication network architectures including those deployed for mobile network, IP Next Generation and ATM Networks,
- to carry out the dimensioning of the networks starting from concepts of traffic,
- to design networks which guarantee a quality of service, more precisely the quality of service of multimedia commulnications
- to conceive architectures ensuring the security of the communications

Main themes

Identical to the contents of the course

Content and teaching methods

The course describes initially the concepts of routed and switched networks and directly gives examples from the ATM networks, IP, ISDN (and Frame Relay). One describes then the local area networks and the methods of access to a physical media (MAC), with a particular accent on the Ethernet networks and an introduction to the industrial netoworks. The network architectures for mobile and wired networks are developped. The concepts of traffic for different types of sources and of function of utility and the related traffic management strategies are then studied. The security management of a network on the basis of use of cryptography and the security tools (Ipv6, PKI, Firewalls) is developed. The security policy of a network is also approached
The course includes three parts, namely part of oral talk supplemented by documents of e-learning, evaluated within the framework of an oral examination, part of laboratory based on the use of a network simulator evaluated on the basis of a technical report and a work on an advanced question of network architecture to be delivered in the form of a WEB document.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

References :
S. Keshav, An engineering approach to networking, Addison Wesley
G. Pujolle, Les Réseaux, Eyrolless
Could be given in English

Other credits in programs

ELEC22	Deuxième année du programme conduisant au grade d'ingénieur civil électricien	(5 credits)
ELEC23	Troisième année du programme conduisant au grade d'ingénieur civil électricien	(5 credits)
ELME22/M	Deuxième année du programme conduisant au grade d'ingénieur civil électro-mécanicien (mécatronique)	(5 credits)
ELME23/E	Troisième année du programme conduisant au grade d'ingénieur civil électro-mécanicien (énergie)	(5 credits)
ELME23/M	Troisième année du programme conduisant au grade d'ingénieur civil électro-mécanicien (mécatronique)	(5 credits)
FSA13BA	Troisième année de bachelier en sciences de l'ingénieur, orientation ingénieur civil	(5 credits)
FSA3DA	Diplôme d'études approfondies en sciences appliquées	(5 credits)
FSA3DS/TL	Diplôme d'études spécialisées en sciences appliquées (télécommunications)	(5 credits)
MAP22	Deuxième année du programme conduisant au grade d'ingénieur civil en mathématiques appliquées	(5 credits)