ELEC2520 ELECTRIC POWER SYSTEMS

[30h+30h exercises] 5 credits

This course is taught in the 1st semester

Teacher(s): Noël Janssens
Language: French
Level: Second cycle

Aims

- To introduce the future engineer into the design, the computation and the exploitation of electric power systems,
- To give a basic training on the electric power systems in use in the industrial environment (large industry or SME), as well as in the generation, transmission and distribution companies, or designed in engineering consultancies.

Main themes

Identical to the contents of the course

Content and teaching methods

- Signals : speech, audio, image, video, data
- Analysis of the electromagnetic fields in transmission lines, fundamental parameters of lossless and lossy transmission lines
- Fundamental equations of transmission lines in harmonic regime : voltage, current, line impedance, reflection coefficient and voltage standing wave ratio
- Construction and use of the Smith Chart, matching methods
- Line matching and conjugate matching, power transfer
- Calculation of transients on transmission lines
- Noises : thermal noise, impulse noise
- Signals and systems : analytic signal, complex envelope, random signals
- Decibels
- Analog modulations : DSB (SC), SSB, VSB, demodulation, noise effect, frequency change
- Angle modulations : FM (narrow and wide band), demodulation, noise effect, capture, threshold effect
- Superheterodyne receiver

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

Teaching method :
- Interactive course, based on a thorough professional experience in the domain,
- Practical exercices proposed via Internet + training together
- Computer computations on power flows, voltage control and frequency control in a meshed network (two students teams).

Prerequisites :
Nihil
Assessment :
Report of the computer computations and related topics
Written (theory + exercice) and oral examination the same half-day

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)	
ELME21/E	Première année du programme conduisant au grade d'ingénieur civil électro-mécanicien (énergie)	(5 credits)	
ELME22/E	Deuxième année du programme conduisant au grade d'ingénieur civil électro-mécanicien (énergie)	(5 credits)	Mandatory
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)	
FSA3DS/EL	Diplôme d'études spécialisées en sciences appliquées (électricité)	(5 credits)	