

Communication channels

Titulaire

Philippe DE DONCKER (Coordonnateur)

Mnémonique du cours

ELEC-H415

Crédits ECTS

5 crédits

Langue(s) d'enseignement

Anglais

Période du cours

Deuxième quadrimestre

Campus

Solbosch

Contenu du cours

Communication channel models - Wireless communication channels - Propagation models for mobile communications - Narrowband fast fading - Microwave links - Base station antennas - Satellite communications - Optical fibers

Objectifs (et/ou acquis d'apprentissages spécifiques)

The student will be able to understand the physical modeling of communication channels, and to design communication links.

Pré-requis et co-requis

Cours ayant celui-ci comme pré-requis

ELEC-H422 | Wireless communication channels | 4 crédits et MEMO-H503 | Master thesis in Electrical Engineering | 24 crédits

Connaissances et compétences pré-requises

High-frequency electromagnetics - antennas - plane waves - propagation in media - reflexion and diffraction of waves - transmission lines - waveguides

Méthodes d'enseignement et activités d'apprentissages

Lectures, exercises, project

Contribution au profil d'enseignement

This teaching unit contributes to the following competences:

- > In-depth knowledge and understanding of exact sciences with the specificity of their application to engineering
- > In-depth knowledge and understanding of the advanced methods and theories to schematize and model complex problems or processes
- > Reformulate complex engineering problems in order to solve them (simplifying assumptions, reducing complexity)
- > Correctly report on research or design results in the form of a technical report or in the form of a scientific paper
- > Collaborate in a (multidisciplinary) team
- > Work in an industrial environment with attention to safety, quality assurance, communication and reporting
- > Think critically about and evaluate projects, systems and processes, particularly when based on incomplete, contradictory and/or redundant information
- > A creative, problem-solving, result-driven and evidence-based attitude, aiming at innovation and applicability in industry and society
- > A critical attitude towards one's own results and those of others
- > Consciousness of the ethical, social, environmental and economic context of his/her work and strives for sustainable solutions to engineering problems including safety and quality assurance aspects
- > The flexibility and adaptability to work in an international and/or intercultural context
- > Has an active knowledge of the theory and applications of electronics, information and communication technology, from component up to system level.
- > Has a profound knowledge of either (i) nano- and opto-electronics and embedded systems, (ii) information and communication technology systems or (iii) measuring, modelling and control.
- > Has a broad overview of the role of electronics, informatics and telecommunications in industry, business and society.
- > Is able to analyse, specify, design, implement, test and evaluate individual electronic devices, components and algorithms, for signal-processing, communication and complex systems.
- > Is able to model, simulate, measure and control electronic components and physical phenomena.
- > Is aware of and critical about the impact of electronics, information and communication technology on society.

Support(s) de cours

Syllabus et Université virtuelle

Autres renseignements

Lieu(x) d'enseignement

Solbosch

Contact(s)

philippe.dedoncker@ulb.be

Méthode(s) d'évaluation

Examen oral et Projet

Examen oral

Question ouverte à développement long

Examen avec préparation

Méthode(s) d'évaluation (complément)

Project: written report. Theory: Oral exam

Langue(s) d'évaluation principale(s)

Anglais

Programmes

Programmes proposant ce cours à l'école polytechnique de Bruxelles

MA-IREL | **Master : ingénieur civil électricien** | finalité Spécialisée électronique et technologies de l'information/bloc 1

