

Communication channels

Lecturer

Philippe DE DONCKER (Coordinator)

Course mnemonic

ELEC-H415

ECTS credits

5 credits

Language(s) of instruction

English

Course period

Second term

Campus

Solbosch

- › 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.

Course content

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

Objectives (and/or specific learning outcomes)

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

Pre-requisites and co-requisites

Courses having this one as pre-requisite

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

Required knowledge and skills

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

Teaching method and learning activities

Lectures, exercises, project

Contribution to the teaching profile

This teaching unit contributes to the following competences:

Course notes

Syllabus and Université virtuelle

Other information

Place(s) of teaching

Solbosch

Contact(s)

philippe.dedoncker@ulb.be

Evaluation method(s)

Oral examination and Project

Oral examination

Open question with long development

Examination with preparation

Evaluation method(s) (additional information)

Project: written report. Theory: Oral exam

Main language(s) of evaluation

English

Programmes

Programmes proposing this course at the Brussels School of Engineering

MA-IREL | **Master of science in Electrical Engineering** | finalité
electronics and information technologies/unit 1

