

Wireless communication channels

Lecturer

Philippe DE DONCKER (Coordinator)

Course mnemonic

ELEC-H422

ECTS credits

4 credits

Language(s) of instruction

English

Course period

Second term

Campus

Solbosch

- › Reformulate complex engineering problems in order to solve them (simplifying assumptions, reducing complexity)
- › Conceive, plan and execute a research project, based on an analysis of its objectives, existing knowledge and the relevant literature, with attention to innovation and valorization in industry and society
- › Correctly report on research or design results in the form of a technical report or in the form of a scientific paper
- › Present and defend results in a scientifically sound way, using contemporary communication tools, for a national as well as for an international professional or lay audience
- › Collaborate in a (multidisciplinary) team
- › Work in an industrial environment with attention to safety, quality assurance, communication and reporting
- › Develop, plan, execute and manage engineering projects at the level of a starting professional
- › 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
- › The flexibility and adaptability to work in an international and/or intercultural context
- › An attitude of life-long learning as needed for the future development of his/her career
- › 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.

Course content

Narrowband wireless communication channels - Spatial characterization - Time characterization - Wideband wireless communication channels - SISO channel models - MIMO channels

Objectives (and/or specific learning outcomes)

The student will be able to understand in-depth physics of wireless channels and to build a wideband channel model

Pre-requisites and co-requisites

Pre-requisites courses

ELEC-H401 | Modulation and coding | 5 crédits and ELEC-H415 | Communication channels | 5 crédits

Teaching method and learning activities

Lectures, exercises, project

Contribution to the teaching profile

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 integrated structural design methods in the framework of a global design strategy
- › In-depth knowledge and understanding of the advanced methods and theories to schematize and model complex problems or processes

Course notes

Syllabus and Université virtuelle

Other information

Place(s) of teaching

Solbosch

Contact(s)

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Evaluation method(s)

Written report and Oral presentation

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 2

