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

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-requisits and co-requisits

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

- > 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 optoelectronics 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 notes

Syllabus and Université virtuelle

Other information

Place(s) of teaching

Solbosch

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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