Digital architectures and design

Titulaire
Dragomir MILOJEVIC (Coordonnateur)

Mnémonique du cours
ELEC-H409

Langue(s) d'enseignement
Anglais

Période du cours
Premier quadrimestre

Campus
Solbosch

Contenu du cours

Basics of Hardware Description Languages; Introduction and VHDL modelling; FPGA architecture; Basic design flow; Concurrent and sequential statements; Signals, variables and advanced statements; Basics of simulation process and simulation kernel operation; State machines, complex design management; Analysis of circuit performance: timing, power and area

Objectifs (et/ou acquis d'apprentissages spécifiques)

Learn to model combinatorial, sequential circuits and finite state machines in VHDL. Learn to handle FPGA design flow tools: design synthesis, implementation, and analysis of results. Understand various approaches towards design modelling, analysis and optimization.

Pré-requis et co-requis

Cours ayant celui-ci comme pré-requis

MEMO-H503 | **Master thesis in Electrical Engineering** | 24 crédits

Méthodes d'enseignement et activités d'apprentissages

Adapted due to COVID-19

Theoretical courses will combine both teaching at distance and in the presence of students. Lecture slides and pre-recorded videos will be made available to the students. After two, or three, course sessions depending on the complexity of the subject at a distance (and deferred) a course session will take place in the presence of the students. All of the material will be seen overviewed to identify parts that need further explanations. A 4-hour question-and-answer session will be organized at the end of the course (and before the exam) at the request of the students.

Labs are taking place in BEAMS laboratory for all those students that are in Belgium. If there are students that will not be able to come to Belgium due to COVID, they should get in touch so that we can organize their remote work. Classes begin 15 minutes later and end 15 minutes earlier than their regular scheduled times, in order to allow for students to enter and leave, and for the room to be aired and cleaned by the students who are leaving and entering. Students/teachers must wear face masks. Hand-sanitizer dispensers are available at the entrance to each building. All the other rules will be applied as specified by our authorities.

Our preferred communication channel will be uv.ulb.ac.be.

Contribution au profil d'enseignement

This teaching unit contributes to the following competences:

> In-depth knowledge and understanding of integrated structural design methods in the framework of a global design strategy

> 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

> 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

> 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 model, simulate, measure and control electronic components and physical phenomena.

Support(s) de cours

Université virtuelle et Podcast

Autres renseignements

Lieu(x) d'enseignement

Solbosch

Contact(s)

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Méthode(s) d'évaluation

Autre

Langue(s) d'évaluation principale(s)

Anglais

Programmes

Programmes proposant ce cours à l'école polytechnique de Bruxelles

MA-IRCB | Master : ingénieur civil biomédical | finalité Spécialisée/bloc 2, MA-IREL | Master : ingénieur civil électricien | finalité Spécialisée électronique et technologies de l'information/bloc 1 et MA-IRIF | Master : ingénieur civil en informatique | finalité Spécialisée/bloc 1 et finalité Spécialisée/bloc 2