



Course Specification Document

Title	Digital Systems Design Using FPGA
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Credits	3.5 ECTS
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Aims	This course aims to provide the student with knowledge related to the structure of FPGA circuits and the methodology of digital design using the VHDL hardware description language, which will later contribute to his professional practice.
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Intended learning outcomes
<p>On successful completion of this course, the student will be able to:</p> <ul style="list-style-type: none">• Identify the structure of FPGA and its components.• Know the methodology of digital systems design.• Understand VHDL code.• Familiarize himself with the Quartus software design tool.• Describe some digital systems, such as digital filters and image and sound processing systems.• Design digital systems from a hardware perspective different from the software perspective.• Deal with a parallel programming language.

Syllabus
<ul style="list-style-type: none">• Programmable logic circuits: PLA, PAL, FPGA: Introduction to programmable logic circuits, FPGA circuit architecture.• VHDL: Language basics, description of combinational circuits, description of sequential circuits, description of state machines, description of memories, description of phase-locked loops.• Designing digital systems using VHDL: Designing image processing systems and displaying them on a VGA screen, designing sound processing systems, and designing digital filters..