

Program	59EC – Communications Electronic Engineering B. Eng.
	59SC – Telecommunications Systems Engineering B. Eng.
	59SO – Sound and Image Engineering B.Eng.
	59TL – Telematics Engineering B. Eng.

Course number and name		
Number	595024027	
Name	Digital Design I	
Semester	S5 [(September-January)]	

	Credits and contact hours
ECTS Credits	4,5
Contact hours	45

Specific course information	
Description of course content	
Basic notions of VHDL (modeling oriented to automatic synthesis), CAD environments	
(with methodology based on HDLs), design and prototyping of combinational and	
sequential systems with VHDL and technology (basic concepts of PLDs).	
List of topics to be covered	
1. CAD+VHDL+Technology	
1.1. Modeling of combinational systems with VHDL	
1.2. Modeling of sequential systems with VHDL	
1.3. Series and carry-lookahead adders	
1.4. Adders/Substractors	
1.5. Carry design and overflow	
1.6. Comparators of magnitude	
1.7. Automata	
1.8. Quartus II and ModelSim tutorials	
1.9. Use of PLD datasheets	
2. Subsystems	
2.1. Structural modeling	
2.2. Modeling, simulation, synthesis and digital subsystems design.	
Prerequisites or co-requisites	

- Electronics II

Specific goals for the course

Specific outcomes of instruction



- RA646 To search, select and use the relevant information provided by the manufacturers of configurable integrated circuits of average complexity.
- RA254 To apply CAD tools to capture, simulate and make digital systems.
- RA642 To perform the analysis, design, test and prototyping of simple combinational and sequential systems using VHDL.
- RA644 To perform the hierarchical descriptions of digital circuits using structural VHDL modeling.
- RA645 To know and use the configurable integrated circuits of different complexity for wired digital systems.
- RA904 To work in pairs with another student, planning weekly working hours and resolving small conflicts which may arise during the course.
- RA903 To use the oscilloscope to carry out and correctly interpret digital signal measures (logic levels, frequencies, indirect measures of current) in simple digital circuits.
- RA643 To analyze, design, test and prototype simple digital subsystems (single-shot records, accumulators, frequency dividers, benches, counters BCD of several digits, counters programmable module, adding BCD and combinations of them) using VHDL.

Further reading and supplementary materials

- Moodle.
- MAX1000 card.