SYLLABUS

Lectures

The course presents the design, modeling, simulation and implementation of digital modules, circuits and systems using a hardware description language (VHDL) and associated CAD tools. Specifically the basic course units are:

- Introduction
  i. Hardware description languages
  ii. Logic circuit synthesis
  iii. Reconfigurable logic devices (CPLD, FPGA)
- VHDL principles
  i. Behavioral description
  ii. Structural description
- Building blocks of combinational and sequential circuits in VHDL (Logic gates, binary functions, multiplexers, flip-flops, registers, counters etc)
- Arithmetic units (Serial and parallel adder/subtractor, multiplier)
- Memory structures (RAM, ROM, EPROM, Flash).
- Synchronous sequential circuit design
- Digital system implementation technologies

Laboratory

The laboratory exercises cover all module topics either by using commercial CAD tools for design and simulation of digital circuits or by implementing low complexity modules with standard ICs (74xx series) or reconfigurable devices.