Digital Logic and System Design

Syllabus for Minor 2

Chapter	Topics	Sections to read	Relevant Exercises
3	Transistor circuits • NMOS/PMOS/CMOS gates, transistor characteristics, voltage levels, noise margins, delays, power, fan-in, fan-out, tri-state buffer, transmission gate Programmable modules • Look-up tables, PLAs, PALs, CPLDs, FPGAs, Various programmable structures, mask programmable gate arrays, field programming techniques, floating gate transistor, SRAM and DRAM cells	3.1 – 3.4 3.6 - 3.10	3.1 - 3.13, 3.25 - 3.28, 3.36 - 3.55
5	Number representation and arithmetic circuits • Representing unsigned and signed numbers, radix conversion, BCD • Operations and circuit design for binary addition, subtraction, comparison, shift • Overflow detection, addition speed up using carry look ahead • Array multipliers with carry propagate and carry save adders	5.1 - 5.6, 5.7.3, 5.9	all
	Circuits for sequential multiplication and division		
6	Multiplexers and LUTs as universal logic modules (ULMs), Shannon's expansion	6.1 – 6.2	6.1 – 6.17
Xilinx Data-sheets	• Configurable logic block in Spartan 6 FPGA, types of slices, resources in a slice (look-up tables, flip-flops, multiplexers, fast carry chain) • DSP48A1 in Spartan 6 FPGA, using DSP48A1 for weighted sum, pipelining options		