

DIGITAL ELECTRONICS DESIGN WITH VHDL

Course Code	20EC6401A	Year	II	Semester	II
Course Category	(Honors)	Branch	ECE	Course Type	Theory
Credits	4	L-T-P	3-1-0	Prerequisites	DLD
Continuous Internal Evaluation:	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes	
Upon successful completion of the course, the student will be able to	
CO1	use modern development tools to design complex digital circuits(L2)
CO2	Analyze syntax and behavior of the VHDL language (L4)
CO3	Design the combinational and sequential logic circuits using VHDL(L3)
CO4	Simulate and make a synthesis of designs using Field Programmable Gate Array (L3)

Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)

Note: 1- Weak correlation 2-Medium correlation 3-Strong correlation

* - Average value indicates course correlation strength with mapped PO

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	2				2					2		2	2	
CO2		2			2					2			2	
CO3	3		3		3					3			3	
CO4	2		2		2					2			2	
Average * (Rounded to nearest integer)	2	2	3		2					2		2	2	

Syllabus

Unit No.	Contents	Mapped CO
I	Introduction to Hardware Description Languages (HDL) and HDL based design, VHDL- Variables, Signals and constants, Arrays, VHDL operators	CO1, CO2
II	Expressions and signal assignments. Entities, architecture specification. Component instantiation. VHDL description of combinational networks, VHDL models for a multiplexer	CO1, CO3
III	VHDL functions, VHDL procedures, Packages and libraries, Compilation, simulation of VHDL code.	CO1, CO3
IV	Modeling flip-flops using VHDL, Modeling a sequential machine, VHDL model for a counter, Synthesis of Combinational and sequential circuits.	CO1, CO3
V	Designing with Programmable Logic Devices: Read-only memories (ROM, EPROM, EEPROM/FLASH), Programmable logic arrays (PLAs), Programmable array logic (PLAs, Designing with FPGAs, Xilinx 4000 series FPGAs, using a one-hot state assignment	CO1, CO4

Learning Resources
Text Books
1. J.Bhaskar- VHDL Primer, Pearson Education Asia, 2001.
Reference Books
1. Fundamentals of Digital Logic with VHDL Design, Stephen Brown and Zvonko Vranesic, McGraw-Hill Higher Education.