

INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
PROFORMA FOR NEW COURSE

1.	Title of the Course	CAD for VLSI Systems
2.	Course Number	EE5028
3.	Status of the Course	Elective
4.	Structure of Credits	3-0-0-3
5.	Offered To	PG
6.	New Course/Modification to	New
7.	To be Offered by	Dr. Vikramkumar Pudi
8.	To take effect from	January 2019
9.	Prerequisite	CoT
10.	Whether approved by the Department	Yes
11.	Course Objective: This course deals with the fundamentals of Computer-Aided Design (CAD) tools for the design, analysis, synthesis, test, verification, routing and placement of digital Very Large Scale Integration (VLSI) systems.	
12.	Course Content: Overview of digital logic design; Simplification of switching functions; K-map based reduction of switching functions; Combinational logic design; Complex combinational logic modules such as multiplexers/ demultiplexers, decoders, PLAs and their use in standardized combinational logic design; Memory elements and time delay concepts, Flip-flops, latches, registers; Sequential circuit concepts and state diagrams; Clock-mode sequential circuits analysis and design; Synthesis of state diagrams; Fundamental-mode sequential circuits; Analysis and design, hazards, races and cycles. Logic element realization; Ideal switch based implementation; Logic families; FET switches; MOS switch based logic realization; NMOS and CMOS logic-Pass transistor logic; Algorithmic optimization of combinational logic; VLSI realization of combinational logic. Language based description of complex digital systems; RTL descriptions and design language representation; Levels of description; Behavioral and structural descriptions; VHDL and Verilog.	
13.	Text book(s): 1. De Micheli, G., <i>Synthesis and Optimization of Digital Circuits</i> , McGraw Hill, (1994). 2. Devadas, S. A., Abhijith Ghosh, A., and Keutzer, K., <i>Logic Synthesis</i> , Kluwer Academic, (1998).	
14.	Reference(s): 1. Brunvand, E., <i>Digital VLSI Chip Design with Cadence and Synopsys CAD Tools</i> , Addison-Wesley, (2010). 2. Gerez, S.H., <i>Algorithms for VLSI Design Automation</i> , Wiley, (1999). 3. Pan, D.Z., <i>VLSI Physical Design Automation</i> , The University of Texas at Austin, (2015). 4. Nowick, S. M., Bhardwaj, K. <i>Computer-Aided Design of Digital Systems</i> , Columbia University, (2016).	