

INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
PROFORMA FOR NEW COURSE

1.	Title of the Course	Computer System Design
2.	Course Number	CS4101
3.	Status of the Course	Core
4.	Structure of Credits	3-0-0-3
5.	Offered To	UG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Computer Science and Engineering
8.	To take effect from	July 2018
9.	Prerequisite	Nil
10.	Whether approved by the Department	Yes
11.	Course Objective: To learn the design of hardware and software components to build a computer system and to develop abilities to diagnose and fix the design and integration errors.	
12.	Course Content: Introduction: Computer system components, Interaction process, and System design flow; Digital logic design: Data representation, Logic optimization, and Data and control path logic block design; Processor Design: Arithmetic circuit design, Data-path design, Control-path design, and Memory system design; High-level synthesis: Design specification, Synthesis to a gate-level netlist, Design verification using simulation, and Clock-tree synthesis and timing analysis; Machine language: Instruction set architecture, Instruction format, Addressing mode, Registers, Memory alignment and address space; Assembler: Symbol table, Parsing process, and Code generation; System integration: High-level programming language, Cross-compilation tool-chain, Interaction of virtual machine, operating system, and the user program, and System testing.	
13.	Text book(s): 1. Nisan N and Schocken S, <i>The Elements of Computing Systems: Building a Modern Computer from First Principles</i> , MIT Press (2008).	
14.	Reference(s): 1. Bryant R E and O'Hallaron D R, <i>Computer Systems: A Programmer's Perspective</i> , Pearson Publishing (2010).	