

# Indian Institute of Technology Tirupati

CS4100: Computer System Design

Credit: L-T-P-C : 3-0-0-3

Syllabus of Test 2 (Quiz 2)

Time : 10 to 10:50 am, 22<sup>nd</sup> Oct, 2019

Venue : Class Room #2 (Temporary Campus)

## 1 Syllabus

The syllabus consists of the lectures from Lecture 9 to Lecture 12. The content of the lectures are elaborated in the following items.

- Lecture 9, 10 and 11: Assembly and Machine Language: Instruction execution model (different class of processor architecture), Hardware-software interaction-from high-level language to machine language, Instruction format and Addressing mode: MIPS and Intel X86, Instruction format and Addressing mode of HACK instruction set architecture, Assembly programming, Function call and stack, Call graphs, Address space and mapping in HACK, Memory mapped I/O.
- Lecture 12: Computer Architecture and Organisation: Stored program concept: von-Neuman Architecture and Turing Machine, Steps of instruction completion (fetch to write-back), Processor design: single cycle data and control path design for N2T (nand 2 tetris processor), micro-operations and control signals.

## 2 Information

Instructor: Jaynarayan T Tudu [jtt@iittp.ac.in]

Teaching Asst: Kirtiman Mishra

Reading Materials:

- Chapter 3, 4, 5 and 6 (partially) of The Elements of Computing System.
- Lecture notes from Lecture 9 to 12.
- B Ryder, “Constructing Call Graph of a Program”, link to the paper
- Patterson and Henessy, Computer Organisation and Design: Hardware Software Interface, Chapter 2 and 4.
- MIPS32 Instruction Set Manual: MIPS Homepage Harvard course
- Intel x86: Lecture notes from USC

Examination Rules: As per the guidelines of Academic Section.