



## COMPUTER SCIENCE & ENGINEERING

# COMPUTER ARCHITECTURE AND ORGANIZATION

### PROF. INDRANIL SENGUPTA

Dept. of Computer Science and Engineering  
IIT Kharagpur



**TYPE OF COURSE** : Rerun | Core | UG

**INTENDED AUDIENCE** : CSE, IT, ECE, EE

**COURSE DURATION** : 12 weeks (28 Jan'19 - 19 Apr'19)

**EXAM DATE** : 28 Apr 2019

**PRE-REQUISITES** : Basic concepts in digital circuit design,

Familiarity with a programming language like C or C++

### PROF. KAMALIKA DUTTA

Dept. of Computer Science and Engineering  
NIT Meghalaya



**INDUSTRIES APPLICABLE TO** : TCS, Wipro, CTS, Google, Microsoft, HP, Intel

## COURSE OUTLINE :

This course will discuss the basic concepts of computer architecture and organization that can help the participants to have a clear view as to how a computer system works. Examples and illustrations will be mostly based on a popular Reduced Instruction Set Computer (RISC) platform. Illustrative examples and illustrations will be provided to convey the concepts and challenges to the participants. Starting from the basics, the participants will be introduced to the state-of-the-art in this field.

## ABOUT INSTRUCTOR :

Prof. Indranil Sengupta has obtained his B.Tech., M.Tech. and Ph.D. degrees in Computer Science and Engineering from the University of Calcutta. He joined the Indian Institute of Technology, Kharagpur, as a faculty member in 1988, in the Department of Computer Science and Engineering, where he is presently a full Professor. He had been the former Heads of the Department of Computer Science and Engineering and also the School of Information Technology of the Institute. He has over 28 - 30 years of teaching and research experience.

Dr. Kamalika Dutta completed her B.Sc. (Computer Science) from Ravenshaw College, Cuttack, India in the year 2003, Master of Computer Application from Biju Pattanaik University of Technology, Bhubaneswar, India in the year 2006, and then Master of Science degree from Indian Institute of Technology, Kharagpur, India in 2010. She completed her Ph.D. from Indian Institute of Engineering Science and Technology, Shibpur, India. She is presently working as an Assistant Professor in the Department of Computer Science and Engineering at National Institute of Technology (NIT), Meghalaya, India.

## COURSE PLAN :

**Week 01** : Evolution of Computer Systems

**Week 02** : Instruction Set Architecture

**Week 03** : Quantitative Principles of Computer Design

**Week 04** : Control Unit Design

**Week 05** : Memory System Design

**Week 06** : Design of Cache Memory Systems

**Week 07** : Design of Arithmetic Unit

**Week 08** : Design of Arithmetic Unit (contd.)

**Week 09** : Input-Output System Design

**Week 10** : Input-Output System Design (contd.)

**Week 11** : Instruction Set Pipelining

**Week 12** : Parallel Processing Architectures