



# OPERATING SYSTEM FUNDAMENTALS

## **PROF.SANTANU CHATTOPADHYAY**

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**INTENDED AUDIENCE :** Undergraduate students of CSE, IT, B.Sc (Computer Science), M.Sc (Computer Science, IT), MCA, MS (Computer Science)

**INDUSTRIES APPLICABLE TO :** All software industries

## **COURSE OUTLINE :**

Operating System is a computer software that manages the hardware components. It acts as an intermediary between the users and the hardware. It is responsible for managing the system resources and providing a smooth working environment for the users. The management includes the following - process management, processor management, memory management, storage management, user management, protection and security. As a subject, it is an amalgamation of the fields like computer architecture, algorithms, data structure and so on. A course on fundamentals of operating systems is essential to equip the students for taking up the challenges in understanding and designing of computer systems. This course will address all the fundamental points, starting from the foundations to the architectural issues to correlation with existing commercial operating systems. Being primarily targeted to a one-semester course for the undergraduate students, the course will follow the current GATE syllabus, enabling the students to prepare well for the same. It can also help all other participants looking for an introduction to the domain of operating systems.

## **ABOUT INSTRUCTOR :**

Prof. Santanu Chattopadhyay received his BE degree in Computer Science and Technology from Calcutta University (B.E. College) in 1990. He received M.Tech in Computer and Information Technology and PhD in Computer Science and Engineering from Indian Institute of Technology Kharagpur in 1992 and 1996, respectively. He is currently a Professor in the Department of Electronics and Electrical Communication Engineering, IIT Kharagpur. Prior to this, he had been a faculty member in the IEST Sibpur and IIT Guwahati in the departments of Computer Science and Engineering. In both these places he has taught the subject Operating Systems several times. His research interests include Digital Design, Embedded Systems, System-on-Chip (SoC) and Network-on-Chip (NoC) Design and Test, Power- and Thermal-aware Testing of VLSI Circuits and Systems. He has published more than 150 papers in reputed international journals and conferences. He has published several text and reference books on Compiler Design, Embedded Systems and other related areas. He is a senior member of the IEEE and an Associate Editor of IET Circuits Devices and Systems journal.

## **COURSE PLAN :**

**Week 1:** Introduction

**Week 2:** Processes and Threads – Part I

**Week 3:** Processes and Threads – Part II

**Week 4:** Interprocess Communication

**Week 5:** Concurrency and Synchronization – Part I

**Week 6:** Concurrency and Synchronization – Part II

**Week 7:** Deadlock

**Week 8:** CPU Scheduling

**Week 9:** Memory Management

**Week 10:** Virtual Memory – Part I

**Week 11:** Virtual Memory – Part II

**Week 12:** File System Processes and Threads – Part I