

Course Name: Introduction to Communicating Distributed Processes
Course Number: CS310
Credits: 3-0-2-4
Prerequisites: CS 307 Systems Practicum
Intended for: UG
Distribution: Discipline core for CSE
Semester: 6th semester

Course Outline:

This course will build up on the knowledge learned in the Systems Practicum class by providing the theoretical concepts. The topics covered will include process management (concept, implementation, scheduling, synchronization, inter-process communication), memory management (paging, segmentation, virtual memory) and the layered communication architecture (socket address, encapsulation, reliability, switching) building up to distributed operating systems (design issues, robustness, concurrency, synchronization). The course will include programming assignments and research on advanced topics.

Course Modules:

- Introduction: Operating systems, Network Architecture
- Process management: Scheduling, Inter-process communication
- Network architecture: Socket address, layering, encapsulation
- Packet Switching: Routing, switching, addressing
- Process coordination: Scheduling, Synchronization, deadlocks
- Network reliability: Protocols, TCP/UDP, Flow Control, Congestion Control
- Network and distributed operating systems: Synchronization, mutual exclusion, concurrency

Textbooks:

1. A. Silberschatz et al, Operating System Concepts
2. A.S. Tanenbaum, Computer Networks

References:

- A.S. Tanenbaum, Modern Operating Systems, 3rd ed., Pearson Ed. Inc., 2008
- B. Davie & L. Peterson, Computer networks, Morgan and Kauffman, 4th ed., 2011.
- B. Forouzan, Introduction to Data Communications and Networking