

High Performance Computing - Video course

COURSE OUTLINE

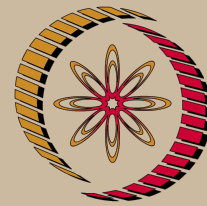
The objective of this course is to learn how to improve the quality of the programs that you write for execution on high performance computer systems.

The course discusses the various activities that happen during program execution, and how they are managed by the hardware (architectural features) and system software (operating systems, run-time systems).

COURSE DETAIL

Sl.No.	Topics	No.of Hours
1	Program execution: Program, Compilation, Object files, Function call and return, Address space, Data and its representation	4
2	Computer organization: Memory, Registers, Instruction set architecture, Instruction processing	6
3	Pipelined processors: Pipelining, Structural, data and control hazards, Impact on programming	4
4	Virtual memory: Use of memory by programs, Address translation, Paging	4
5	Cache memory: Organization, impact on programming, virtual caches	5
6	Operating systems: Processes and system calls, Process management	6
7	Program profiling	2
8	File systems: Disk management, Name management, Protection	4
9	Parallel architecture: Inter-process communication, Synchronization, Mutual exclusion, Basics of parallel architecture, Parallel programming with message passing using MPI	5
	Total	40

References:



NP-TEL

NPTEL

<http://nptel.iitm.ac.in>

Computer Science and Engineering

Pre-requisites:

Computer programming, Data structures.

Coordinators:

Prof. Mathew Jacob
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1. J. L. Hennessy and D. A. Patterson, Computer Architecture: A Quantitative Approach, Morgan Kaufmann.
2. A. Silberschatz, P. B. Galvin, G. Gagne, Operating System Concepts, John Wiley.
3. R. E. Bryant and D. R. O'Hallaron, Computer Systems: A Programmer's Perspective, Prentice Hall.