III Year Sem II B.Tech CSE	ELECTIVE	L	T	P	C
Code: CS3604	High Performance Computing	2	2	0	4

Learning Outcomes

Unit-I
Performance measures: Speedup, efficiency and scalability

Unit-II
Model of parallel computation and basic communication primitives

Unit-III
Parallel prefix and applications, parallel sorting, Embeddings, Parallel matrix algorithms

Unit-IV
Communication networks for parallel computers and parallel models of computation, Parallel fast Fourier transforms.

Unit-V
Parallel Programming with MPI: Writing and executing MPI programs, collective communication,

Unit-VI
Grouping data for communication, communicators and topologies

Text Books:

1ntroduction to Parallel Computing: Design and Analysis of Algorithmsby A. Grama, A. Gupta, G.Karypis and V. Kumar.

2.Petascale Computing: Algorithms and Applications, David A. Bader (Ed.), Chapman &

Hall/CRC Computational Science Series, 2007

3. Parallel Programming with MPIby Peter S. Pacheco.

Reference Books:

1. Grama, A. Gupta, G. Karypis, V. Kumar, An Introduction to Parallel Computing, Design

and Analysis of Algorithms: 2/e, Addison-Wesley, 2003.

2. G.E. Karniadakis, R.M. Kirby II, Parallel Scientific Computing in C++ and MPI: A Seamless

Approach to Parallel Algorithms and their Implementation, Cambridge University Press, 2003.

3.Wilkinson and M. Allen, Parallel Programming: Techniques and Applications Using Networked Workstations and Parallel Computers, 2/E, Prentice Hall, 2005.

5. M.J. Quinn, Parallel Programming in C with MPI and OpenMP, McGraw-Hill, 2004.

6. G.S. Almasi and A. Gottlieb, Highly Parallel Computing, 2/E, Addison-Wesley, 1994.

7.J. Dongarra, I. Foster, G. Fox, W. Gropp, K. Kennedy, L. Torczon, A. White, editors, The Sourcebook of Parallel Computing, Morgan Kaufmann, 2002

Web links:

1. http://www.netlib.org/utk/papers/mpi-book/mpi-book.html

2. https://computing.llnl.gov/tutorials/mpi

3. http://www.mcs.anl.gov/research/projects/mpi/www/www3/