CSS 5103: HIGH PERFORMANCE COMPUTING SYSTEMS [3 1 0 4]

Introduction to Parallel Computing, Need for Parallel Computing, Programmatic levels of parallel processing, Parallel Computer Structures, Handler's classification, Feng's classification, Applications of parallel processing, Synchronous Parallel Processing, Inter-PE Communications, Interconnection network, Parallel programming in OpenMP, OpenMP functions, Threads synchronization, OpenMP critical section, Message Passing Interface Programming, Message Passing Libraries, Point to point communication, Collective communication, MPI error handling, Heterogeneous Computing, OpenCL Architecture, Host/Device interaction, Kernels and OpenCL execution models, Program layout, Memory model, Thread structure, Work-item and workgroup, Introduction to CUDA, CUDA programming model, CUDA threads, CUDA programming basics.
SDL: Applications of parallel processing, Design of Interconnection network, OpenMP programming [1], [2]

References:
1. Kai Hwang, Faye A. Briggs, Computer Architecture and Parallel Processing, Tata McGraw-Hill India, 2012.
2. Michael J. Quinn, Parallel Programming in C with MPI and OpenMP, McGraw Hill, 2003.
3. Benedict R. Gaster, Lee Howes, David R, Perhaad Mistry, Dana Schaa, Heterogeneous Computing with OpenCL, Morgan Kaufmann, 2012.
4. David B. Kirk, Wen-mei W. Hwu, Pragramming Massively Parallel Processors, A Hands-on Approach, (2e),Elsevier, 2012.