INTRODUCTION TO PARALLEL
PROGRAMMING IN OPENMP

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TYPE OF COURSE : Rerun | Core/Elective | UG/PG
COURSE DURATION : 4 Weeks (18 Jan' 21 - 12 Feb' 21)
EXAM DATE : 21 Mar 2021

PRE-REQUISITES : Students enrolling for this course should be comfortable with programming in C.

INTENDED AUDIENCE : Computer Science and non-Computer Science Students with interest in parallel programming for HPC applications.

INDUSTRIES APPLICABLE TO : IBM, Intel, Amazon, Google, Microsoft, Cray.

COURSE OUTLINE :
This course focuses on the shared memory programming paradigm. It covers concepts & programming principles involved in developing scalable parallel applications. Assignments focus on writing scalable programs for multi-core architectures using OpenMP and C. This is an introductory course in shared memory parallel programming suitable for computer science as well as non-computer science students working on parallel/HPC applications and interested in parallel programming.

ABOUT INSTRUCTOR :
Yogish Sabharwal is a researcher at IBM Research and serves as an adjunct faculty at IIT Delhi. At IBM, he manages the high performance computing group, that ensures that real-world applications are able to extract the best performance out of HPC systems. He has 70+ papers including 3 best paper awards, 2 best paper nominations and a Gordon Bell finalist. His work has won several competitions organized in the HPC community.

COURSE PLAN :
Week 1: Single Processor Architecture and Basic OpenMP constructs & functions
Week 2: More OpenMP constructs & functions
Week 3: Basic Linear Algebra using OpenMP and OpenMP tasks (Assignment 1: Programming assignment to implement and evaluate blocked matrix multiply in OpenMP)
Week 4: Critical Sections, locks and Matrix Factorization using OpenMP (Assignment 2: Programming assignment to implement and evaluate task based algorithm for a BLAS routine).