CO332 - Heterogeneous Parallel Computing

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http://bt.nitk.ac.in/c/17b/co332/index.html
What you’ll learn ...

● How to program heterogeneous parallel computing systems and achieve
  – high performance and energy efficiency
  – functionality and maintainability
  – scalability across future generations

● Topics
  – Parallel programming frameworks – CUDA and Xeon Phi
  – Principles and patterns of parallel algorithms
  – Processor architecture features and constraints
Reference Material

- D. Kirk and W. Hwu, “Programming Massively Parallel Processors – A Hands-on Approach,” 3e, MK.
- NVIDIA, NVidia CUDA C Programming Guide, Nvidia
- Intel Xeon Phi Coprocessor Developer's Quick Start Guide
- Online Courses
Course Coverage

- CUDA C and Xeon Phi Parallel Programming
- GPU Memory Model
- Memory Bandwidth Conservation
  - Matrix-matrix multiplication
- Parallel Scan Pattern
- Parallel Histogram Pattern and Atomic Operations
Course Components

- Programming Assignments
- Programming Quizzes
- Course Project
  - NP hard problems, Domain problems, HiPC Programming Challenge, and so on
- Midsem and Endsem exams
is the Best Policy

• You are encouraged to discuss assignments with your friends and enemies
  – Coming up with a super solution for a problem together is great!

• Any sharing of code is unacceptable
  – Reading someone else’s code and then going off to write your own is also a questionable practice