

Course Name: High Performance Computing Tools

Instructor: László Kovács

Course Number: INCF351-K2

Course Type: Laboratory

Course mode: Full-time training

Sessions per week: 0 + 2

Credits: 2

Term grade: Term grade is based on the result of the project work.

Examination method:

During the semester, each student has to work on his/her own individual project involving high performance computing tools. At the end of the term, the output of the project (massively parallelized algorithmic solution) has to be presented and defended.

Other expectations:

The maximum number of non-attendance is 3.

Syllabus:

- Introduction to the usage of make, GNU make, automake, cmake and qmake to support large-scale development.
- Introduction to the parallel programming tools for shared memory multiprocessor architectures (OpenMP, pthread, Threading Building Blocks).
- Introduction to the parallel solutions for Grid Computing (OpenMPI, PVM, Grid Engine, SLURM).
- Introduction how to work and use the Clustered Systems and Supercomputers (Visiting HPC of Debrecen) equipped with Coprocessors (NVidia, Intel Phi)
- Introduction to the massive parallelization with OpenCL involving CPU and GPU cores
- Introduction to CUDA Toolkit
 - NEW Classroom Material: GPUPeachingKit
 - Case studies: image processing problems

Ethical standards:

The ethical standards are predefined in the CODE OF CONDUCT OF THE UNIVERSITY OF DEBRECEN:

<http://www.unideb.hu/portal/hu/node/47>

http://www.unideb.hu/media/17_217.pdf