**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

# Examination method:

All students have to work on own identical project involving high performance computing tools during the term. At the end of the term the output of the project (massively parallelized algorithmic solution) have to be presented and defended.

# Other expectations:

The maximum number of non-attendance is 3.

# Syllabus:

* Introduction the usage of make, GNU make, automake, cmake és qmake to support large-scale development.
* Introduction the parallel programming tools for shared memory multiprocessor architectures (OpenMP, pthread, Threading Building Blocks).
* Introduction 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 the massive parallelization with OpenCL involving CPU and GPU cores
* Introduction the CUDA Toolkit
  + NEW Classroom Material: GPUTeachingKit
  + Case studies: image processing

# 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