Parallel technologies   **Course Syllabus**
Course Code: IVM327AN   Time: Wednesday 9:30-12:45
Semester: Spring 2018/2019 2.

                                                                              Location: PTE MIK, A-101

General Information:

Name of Course:	# PARALLEL TECHNOLOGIES
Course Code:	IVM327AN
Semester:	2nd
Number of Credits:	4
Allotment of Hours per Week:	2 lectures, 2 practices
Evaluation:	Project work
Prerequisites:	**Computer Architecture I.**
Instructors:	**Péter NOVÁK, technical supporting staff**
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Introduction, Learning Outcomes

The course is intended for master students on Computer Science Engineering program to conduct high level discussion and argument about parallel programming techniques of computer clusters. Finally, the de facto parallel programing standard of distributed systems - OpenMPI - is introduced throughout practical examples.

Upon completion of this course the student should be able to:

1. understand
      a. parallel execution environments,
      b. parallel programming patterns of distributed systems,
      c. limitations of parallel programming,
2. write message passing parallel programs
3. analyse problems for parallel execution

General Course Description and Main Content:

Through the introduction of parallel numerical simulations, the basic parallel programming techniques and patterns are discussed. Specifically, the sequential calculation of thermal conduction in a heated metal plate and the sequential generation of Mandelbrot sets are introduced, which is followed by the parallelization of the aforementioned problems. Finally, the sequential and parallel solutions are compared and the speed-up is measured.

The Course includes:
- Regular (weekly) lectures and tutorials.
- Continuous communication and discussion between the Attendance and Lector. Common evaluation.

Methodology:

The course is based on continuously discussions of actual topics. The student's verbal feedback is required.

Methods:
1. discussion and lectures about theory
2. execution of tutorials

Schedule:

Attendance:

Attending is required all classes, and will impact the grade (max. 10%). Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lesson will be grounds for failing the class. To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 20 minutes

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will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

Evaluation + Grading

Numeric Grade:	5	4	3	2	1
Evaluation in points:	89%-100%	77%-88%	66%-76%	55%-65%	0-54%

Students with special needs:
Students with special physical needs and requiring special assistance must first register with the Dean of the Students Office. All reasonable requests to provide an equal learning environment for all students is to be assured.

Required:
1. Presentation slides, Neptun Meet Street
2. Várady, Zavánij: Introduction to MPI, Typotex 2014

Further readings:
1. R. Chandra, L. Dagum, D. Kohr, D. Maydan, J. McDonald, R. Menon: Parallel Programming in OpenMP, Academic Press, 2001.
2. G. Em Karniadakis, R. M. Kirby II: Parallel Scientific Computing in C++ and MPI, Cambridge University Press, 2007.
3. B. Wilkinson, M. Allen: Parallel Programming, Techniques and applications using networked workstations and parallel computers, Pearson Prentice Hall, 2005.