**General Information:**

**Name of Course: Parallel Algorithm and Programming**

**Course Code:** PM-TRTNM715-HA

**Semester: 2**nd

**Number of Credits:** 4

**Allotment of Hours per Week:** 2 Lectures and 2 Practical tutorials / Week

**Evaluation:** Exam

**Prerequisites: -**

**Instructors: Dr Peter IVÁNYI, Professor**

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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. The course provides theoretical background for parallel programming and parallel numerical simulations. With regards to simulations the course discusses mesh generation briefly and partitioning in details. Finally one of the easiest parallel programming approach, OpenMP, is introduced via theoretical and practical explanations

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

1. understand

a. parallel execution environments,

b. parallel programming patterns,

c. limitations of parallel programming,

2. write 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 mesh generation method is introduced, which is followed a detailed discussion of partitioning of finite element meshes. Parallel version of all algorithms are also discussed. Finally the parallelisation of problems with the OpenMP environment is discussed in the course.

The Course includes:

* Regular (weekly) lectures and tutorials.
* Continuously 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 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**

Grading will follow the course structure with the following weight: Project 01 - 10%, Project 02 - 10%, Homework 01 - 10%,. The remaining 70% will be assessed by a written exam. Please note that attendance will adversely affect one's grade, both in direct grade reduction and in missing work in the development of a project.

Grading Scale:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Numeric Grade: | 5 | 4 | 3 | 2 | 1 |
| Evaluation in points: | 89%-100% | 76%-88% | 63%-75% | 51%-62% | 0-50% |

**PTE Grading Policy:**

Information on PTE’s grading policy can be found at the following location:

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**Students with Special Needs:**

Students with a disability and needs to request special accommodations, please, notify the Deans Office. Proper documentation of disability will be required. All attempts to provide an equal learning environment for all will be made.

**Readings and Reference Materials:**

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**Required:**

1. Presentation slides, Neptun Meet Street
2. Topping, Muylle, Ivanyi, Putanowicz, Cheng: Finite Element Mesh Generation, Saxe-Coburg, 2007

**More:**

1. Mattson, Sanders and Massinghill: Patterns for Parallel Programming, 2005.