COURSE SYLLABUS AND COURSE REQUIREMENTS
ACADEMIC YEAR 2023/2024 SEMESTER AUTUMN

Course title	*PARALLEL ALGORITHMS AND PROGRAMMING*
Course Code	IVM325ANMI
Hours/Week: le/pr/lab	2/2/0
Credits	4
Degree Programme	Computer Science Engineering MSc
Study Mode	
Requirements	Exam
Teaching Period	Autumn
Prerequisites	-
Department(s)	Department of System and Software Technology
Course Director	
Teaching Staff	*Peter Ivanyi*

COURSE DESCRIPTION

A short description of the course (max. 10 sentences).
Neptun: Instruction/Subjects/Subject Details/Basic data/Subject description

Hardware for parallel programming, basic terms and laws of parallel programming, efficiency, programming patterns, OpenMP programming, Finite Element Modelling, Finite Element meshing and partitioning for parallel programming

SYLLABUS

Neptun: Instruction/Subjects/Subject Details/Syllabus

1. GOALS AND OBJECTIVES

Goals, student learning outcome.
Neptun: Instruction/Subjects/Subject Details/Syllabus/Goal of Instruction

The main goal of the course is to familiarize students with the basics of parallel programming.

2. COURSE CONTENT

Neptun: Instruction/Subjects/Subject Details/Syllabus/Subject content

	TOPICS
LECTURE	1. *Introduction, parallel architectures, efficiency* 2. *Parallel programming patterns* 3. *OpenMP programming* 4. *Mesh generation* 5. *Mesh partitioning*
PRACTICE	1. *Measurement of efficiency* 2. *C and OpenMP programming practice* 3. *Mesh generation in practice* 4. *Mesh partitioning in practice*
LABORATORY PRACTICE	

DETAILED SYLLABUS AND COURSE SCHEDULE

ACADEMIC HOLIDAYS INCLUDED

LECTURE

week	**Topic**	**Compulsory reading; page number (from … to …)**	**Required tasks (assignments, tests, etc.)**	**Completion date, due date**
1.	Introduction			
2.	Parallel architectures			
3.	Efficiency			
4.	Parallel programming patterns			
5.	Parallel programming patterns			
6.	OpenMP programming		Homework 1	Week 10
7.	OpenMP programming			
8.	OpenMP programming			
9.	Autumn break			
10.	Mesh generation			
11.	Mesh generation			
12.	Mesh partitioning			
13.	Mesh partitioning			
14.				
15.				

PRACTICE, LABORATORY PRACTICE

week	**Topic**	**Compulsory reading; page number (from … to …)**	**Required tasks (assignments, tests, etc.)**	**Completion date, due date**
1.	-			
2.	Discussion about parallel architectures			
3.	Measurement of parallel efficiency			
4.	Demonstration of programming patterns			
5.	C programming			
6.	OpenMP examples			
7.	OpenMP examples			
8.	OpenMP practice			
9.	Autumn break			
10.	Mesh generation in practice			
11.	Mesh generation in practice			
12.	Mesh partitioning in practice			
13.	Mesh partitioning in practice			
14.				
15.				

3. ASSESSMENT AND EVALUATION

(Neptun: Instruction/Subjects/Subject Details/Syllabus/Examination and Evaluation System)

ATTENDANCE

In accordance with the Code of Studies and Examinations of the University of Pécs, Article 45 (2) and Annex 9. (Article 3) a student may be refused a grade or qualification in the given full-time course if the number of class absences exceeds 30% of the contact hours stipulated in the course description.

Method for monitoring attendance *(e.g.: attendance sheet / online test/ register, etc.)*

Attendance at 70% of classes is mandatory. The participation rate does not affect the grade, but an absence of more than 30% results in the failure of the class.
Attendance is checked on the basis of an attendance sheet

ASSESSMENT

Cells of the appropriate type of requirement is to be filled out (course-units resulting in mid-term grade or examination). Cells of the other type can be deleted.

Course-unit with final examination

Mid-term assessments, performance evaluation and their weighting as a pre-requisite for taking the final exam

(The samples in the table to be deleted.)

Type	Assessment	*Weighting as a proportion of the pre-requisite for taking the exam*
1. *Homework*	*acceptance by lecturer*	*100 %*

Requirements for the end-of-semester signature

(Eg.: mid-term assessment of 40%)

Homework must be submitted during the semester and the instructor must accept it in order to complete the signature. Incomplete or incorrect homework will be returned and must be corrected and resubmitted.

Re-takes for the end-of-semester signature (PTE TVSz 50§(2))

The specific regulations for grade betterment and re-take must be read and applied according to the general Code of Studies and Examinations. E.g.: all the tests and the records to be submitted can be repeated/improved each at least once every semester, and the tests and home assignments can be repeated/improved at least once in the first two weeks of the examination period.

There is always +1 week available for correcting the homework beyond the deadline.

Type of examination *(written, oral):* *oral exam*

The exam is successful if the result is minimum 40 %. *(The minimum cannot exceed 40%.)*

Calculation of the grade *(TVSz 47§ (3))*

The mid-term performance accounts for ***0*** %, the performance at the exam accounts for ***100*** % in the calculation of the final grade.

Calculation of the final grade based on aggregate performance in percentage.

Course grade	Performance in %
excellent (5)	85 % …
good (4)	70 % ... 85 %
satisfactory (3)	55 % ... 70 %
pass (2)	40 % ... 55 %
fail (1)	below 40 %

The lower limit given at each grade belongs to that grade.

4. SPECIFIED LITERATURE

In order of relevance. (In Neptun ES: Instruction/Subject/Subject details/Syllabus/Literature)

COMPULSORY READING AND AVAILABILITY

[1.] Barry Wilkinson, Michael Allen: Parallel Programming, Techniques and Applications Using Networked Workstations and Parallel Computers, Pearson Education Inc, 2005, ISBN: 0-13-140563-2

[2.] Timothy G. Mattson, Beverly A. Sanders, Berna L. Massingill: Patterns for Parallel Programming, Pearson Education Inc, 2005, ISBN: 0-321-22811-1

[3.] Robit Chandra, Leonardo Dagum, Dave Kohr, Dror Maydan, Jeff McDonalds, Ramesh Menon: Parallel Programming in OpenMP, Academic Press, 2001, ISBN: 1-55860-671-8

[4.] B.H.V Topping, J. Muylle, P. Iványi, R. Putanowicz, B. Cheng: Finite Element Mesh Generation, Saxe-Coburg Publications, 2004, ISBN: 1-87-4672-10-5

RECOMMENDED LITERATURE AND AVAILABILITY

[1.] Lecture notes