

Program		Type of studies (cycle)	Third cycle		
		Name of the program	SEE Doctoral Studies in Mathematical Science		
Course					
Course title		Compiler and Software support for parallel computer architectures			
Course code	Semester	Course status	ECTS credits	Contact hours	
	II		10	30	
Teaching staff	Teacher				
	Other staff	Dr. Manfred Liebmann			
Course goals	<p>The main goal of the course is to acquire knowledge about parallel computing. Course contains introductory lectures but mainly guided and independent work of the students on the following parallel platforms. At least two of the following platforms should be experienced by each student during the course:</p> <ul style="list-style-type: none"> - Multiple core workstation with shared memory using OpenMP - Distributed memory computer using MPI (OpenMPI) - Many-core parallelization with GPUs (and Intel's Larrabee if already available) on basis of CUDA or OpenCL <p>The students will be able to write their own mathematical code for the parallel platform chosen.</p>				
Course content/topics					
<ul style="list-style-type: none"> • Concurrent and distributed programming based on C/C++/Java • Parallel processing based on Open source tools • Parallel processing based on OpenMP for shared memory systems • Parallel processing based on MPI for distributed memory systems • Grid and Cloud computing • Recent parallel programming standards as OpenCL (CUDA) 					
LITERATURE		Grading			
<p>[1] D. Kirk and W. Hwu, Programming Massively Parallel Processors: A Hands-on Approach, Elsevier, 2010.</p> <p>[2] T. Rauber and G. Runger, Parallel Programming: for Multicore and Cluster Systems, Springer, Berlin, 2010.</p> <p>[3] M. Sair, D. Walker, and J.Dongarra. MPI: Complete Reference. The MIT Press, 1996.</p>			Criterion	Points	Cut-off points
		1.	Written assignment	20	11
		2.	Project	40	22
		3.	Final exam	40	22
		Total			100