Data:	IHPC. MA. Nr. 3210	Version: 02.12.2010	Start Year: WiSe 2012
Module Name:	**Introduction to High Performance Computing and Optimization**		
(English):			
Responsible:	Rheinbach, Oliver / Prof. Dr.		
Lecturer(s):	Rheinbach, Oliver / Prof. Dr.		
Institute(s):	Institute of Numerical Mathematics and Optimization		
Duration:	1 Semester(s)		
Competencies:	The students shall have an understanding of and ability to apply: • Parallel numerical algorithms • Parallel computing on shared and distributed memory multiprocessor systems. The students know relevant terms in English.		
Contents:	Most important ingredients are: • Design and analysis of algorithms • Portable parallel programming with OpenMP and the MPI (Message Passing Interface) • Code profiling and tracing (VAMPIR) and optimization methods • BLAS (Basic Linear Algebra Subprograms) • Parallel Equation Solution (dense/sparse systems) • LU-Decomposition, Tridiagonal Solvers, Iterative Methods • International literature and relevant terms in English		
Literature:			
Types of Teaching:	S1 (WS): Lectures (2 SWS) S1 (WS): Exercises (1 SWS)		
Pre-requisites:	**Misc:** Basics of numerical analysis and knowledge in scientific programming		
Used in:	Computational Science and Engineering, MA (WP)		
Frequency:	yearly in the winter semester		
Requirements for Credit Points:	For the award of credit points it is necessary to pass the module exam. The module exam contains: MP/KA: MP = individual examination (KA if 20 students or more) [MP minimum 30 min / KA 120 min] Requirements for the module exam: PVL: Programming Project		
Credit Points:	4		
Grade:	The Grade is generated from the examination result(s) with the following weights (w): MP/KA: MP = individual examination [w: 1]		
Workload:	The workload is 120h. It is the result of 45h attendance and 75h self-studies.		