



Module title High Performance Computing				
Module code YHPC	Level Bachelor (B.Sc.)	Hours per week 4	ECTS credits 5	Duration 1 semester
Module instructor Prof. Dr. Dünneweber	Lecture type Interactive seminar Lab sessions	Prerequisite(s) Good academic standing	Grading Final exam	
Objectives The lecture "High-Performance Computing" is intended to provide an overview of the broad topic of distributed and parallel computing using clusters, grids, clouds, SMP servers, peer-to-peer networks and other parallel platforms. It covers the writing of multi-threaded programs with Java, C & Pthreads and parallel programming using MPI and OpenMP as well. This lecture aims at students who want to become acquainted with parallel computing and who already have some experience with sequential programming using Java and C (on top of Linux/Unix).				
Content The lecture begins with a discussion on parallel computing - what it is and how it is used - followed by a discussion on theoretical concepts and terminology associated with parallel computing. The topics of parallel memory architectures and programming models are then explored. These topics are followed by a series of practical discussions on a number of the complex issues related to designing and running parallel programs, including heterogeneity and efficiency, parallel debugging etc. The lecture is accompanied by a tutorial showing several examples of how to parallelize serial programs.				
Textbook/teaching material <ul style="list-style-type: none">• Parallele Programmierung (Thomas Rauber, Gudula Rünger)• Parallel Programming in C with MPI and OpenMPI (Michael J. Quinn)				

Note: this is not the official course descriptor according to the "Studien- und Prüfungsordnung" (SPO)