

Parallel Computing

Programming of multiprocessor systems, cluster computing, grid computing

Target group(s):	7. Semester KTB 7. Semester SWB 7. Semester TIB	Module number	IT 701-26
Workload:	2 Credits		60 Hours
therefrom	Contact hours		30 Hours
	Self study		15 Hours
	Exam preparation		15 Hours
Language of instruction:	German / English		
Module owner:	Prof. Dr. Peter Väterlein		
Date:	01. 10. 2011		

Prerequisites:

- Principles of scalar computer architectures (von Neumann- / Harvard architectures)
- Programming language C
- Operating system UNIX from the view of the user and the application programmer

Total Target:

- Knowledge and ability to evaluate different parallel computer architectures.
- Ability to design and implement applications for parallel computers

Module content:

- Overview over the common parallel server architectures
- Principles of designing parallel software
- Performance Evaluation of parallel Software
- Memory coupled and message coupled systems
- Load balancing and waiting line systems
- Basics of grid computing
- Practical exercises:
 - Programming of message coupled computer systems
 - Programming of multicore-processor architectures

Reference material:

- T. Ungerer: Parallelrechner und parallele Programmierung, Spektrum Verlag, 1997
- I. Foster: Designing and Building Parallel Programs, Addison Wesley, 1994
- A. Tanenbaum: Distributed Systems, Prentice Hall, 2002

Offered:

Summer semester

Submodules and assessment:

Type of instruction: Lectures with follow-up work and preparation for examination
Type of assessment: Oral examination, 20 minutes

Semester periods per week: 2 SWS
Estimated student workload: 60 hours

Aims, learning outcomes:

- Ability to evaluate the field of application, the advantages and disadvantages of different parallel architectures
- Knowledge of parallel programming principles and the ability to develop application programs for parallel computer architectures