Therefore, the course makes the students familiar with both hardware and software aspects of SMPs, as well as with clustering of SMPs to very high performance computing systems. The lecture is three hours per week, and is being offered as a special course in Computer Architecture for students in the third or fourth year of their studies (Hauptdiplom).

Topics covered are: overview of SMP architecture, features of modern microprocessors and busses supporting multiprocessing, caches and cache consistency, memory architecture, synchronization, and architectural case studies; operating system concepts for SMPs, programming SMPs with (POSIX) threads, and alternative programming models like compiler directives; benchmarking of SMPs; and finally, interconnecting multiple SMPs to highly parallel systems, with case studies like the SCI interconnect.

7.2.1.8 Discrete-Time Simulation (*Diskrete Simulation*)

by Hermann Hellwagner

This course introduces the basic principles and techniques of modelling and simulation of computer systems. The aim of this three-hour course is to provide the students with the methodological foundation and some practical guidelines to conduct sound performance analysis studies, and to point out potential pitfalls involved therein. The simulation language MODSIM III is introduced and used for case studies and projects.

The course covers: terminology and basic concepts of discrete-time simulation; simple analytical models, e.g. Little's law, M/M/1 model; performance criteria; architecture and components of simulation models and simulation environments; random-number and random-variate generation and testing; analysis of simulation results; guidelines for and pitfalls of simulation studies; approaches to parallel simulation; the simulation language MODSIM; and various case studies.

7.2.1.9 Interconnection Networks (*Verbindungsnetze*)

by Harald Richter

The lecture 'Verbindungsnetzwerke für parallele und verteilte Systeme' (Interconnection Networks for Parallel and Distributed Systems) gives an overview on the mathematical and technical foundations of networks for parallel and distributed systems. Topics are connection types, data transport, routing and topologies. Especially for static networks, the most important network types as well as deadlock-free adaptive and non-adaptive routing methods are explained in detail.

The lecture is intended for students from Computer Science and Electrical Engineering that are interested in local and global networks as well as networks for parallel and distributed computing systems.