Module name:	**Computer structures**
Abbreviation:	RS
Study semester:	2nd semester (SS), frequency: once a year
Responsible for module:	Volker Ahlers
Teaching staff:	Volker Ahlers, Bernd Laumann
Language:	German
Place in curriculum:	Bachelor, compulsory subject, 2nd semester
Teaching methods/SWS:	2 SWS lecture with approx. 80 students 2 SWS exercise with approx. 20 students
Work required:	Lecture = 34 h Exercise = 34 h Own study time = 52 h
Credit points:	4 CP (= 120 h)
Prerequisites acc. to exam regulations:	None
Recommended prerequisites:	Fundamentals of computer science, Programming I
Learning goals:	Skills in algorithms: Taking into account processor architecture and the storage hierarchy in programming Skills in design and realization: Ability to understand and to develop new assembler programs Technological skills: Understanding the way in which microprocessors and computers work; knowledge of typical computer architectures, incl. embedded systems; knowledge of methods to enhance performance, incl. parallelization Skills in methodology: Ability to evaluate and compare the performance of processors and computers
Contents:	Microprocessors: ALU, FPU, register, control unit, data path Computer architecture: Von-Neumann architecture, CISC and RISC architecture, microprogramming, pipelining, interrupts, bus systems, I/O interfaces, parallelization, multi-core processors, embedded systems, performance evaluation and benchmarks Memory management: Memory hierarchy, virtual memory, cache Assembler programming: Machine language, command set, mnemonics, memory addressing, stack, subprograms, operating system and I/O interfaces, programming exercises
Examinations:	Examination (written or oral examination) and experimental work
Media forms:	Lecture: Presentation, board, examples, discussion Exercise: Independent problem-solving in groups of 2, assessment of the solutions, individual discussion
Literature:	Patterson, D.A., J.L. Hennessy: Rechnerorganisation und -entwurf. Spektrum, latest edition. Tanenbaum, A.S., J. Goodman: Computerarchitektur. Pearson, latest edition. Duntemann, J.: Assembly Language Step by Step. Wiley, latest edition.