Module description: System-oriented programming

Module Code	t.BA.IT.SNP.19HS
ECTS Credits	4
Language of Instruction/Examination	German
Organizational Unit	InES
Module Coordinator	Hans Dermot Doran
Legal Framework	The module description is part of the legal basis in addition to the general academic regulations. It is binding. During the first week of the semester a written and communicated supplement can specify the module description in more detail.
Module Characteristic	Type 3a 2 lecture lessons per semester week and class+ 2 lab bi-weekly lessons per semester and half-class
Module Description	C and Unix-like operating systems are closely related and are indispensable in today's computer science. You will become familiar with the basics of C and programming applications in C as well as interfacing with and via the (Linux) operating system using POSIX calls.
Module Content	**Lectures** • Basic program elements (language elements, data types, variables, constants, declarations, operators, expressions, control structures, structures), functions, arrays, pointers, memory management, modular programming (incl. preprocessor, compiling and linking). MISRA C. • Processes and threads. Coordination and cooperation, process synchronisation, inter-process communication. Data handling, memory management, file systems. **Laboratories** • First programs in C; Struct, enum and functions; arrays; pointers, arrays and strings; linked lists, dynamic memory management, modular programming; processes and threads, files, synchronisation, inter-process communication.
Prerequisite Knowledge	

Learning Objectives (Competences)	Students...	Competencies	Taxonomies
	understand memory management and optimise memory accesses	M, F	K3
	can use an operating system shell.	M, F	K3
	can explain the operation of a file system and use the appropriate system calls.	F, M	K3
	can explain the fundamental components of a computer system including cache, memory management unit, DMA and floating point units.	F, M	K2
	understand and can use the concepts of processes and threads and can use the appropriate system calls and test multi-threading and multi-process programs. You can understand and use synchronisation and inter-process communication system calls.	F, M	K3
	have the ability to use, understand, program and test small programs in the C programming language. Students learn the competence to program and test larger programs	M, F	K3

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Performance Assessment	**End-of-module exam**	**Assessment**	**Length (min.)**	**Weighting**	**Form**
	written exam	Grade	90	80	acc. to module agreement

	Performance assessment during the semester	**Assessment**	**Length (min.)**	**Weighting**	**Form**
	oral exam	Grade	60	20	acc. to module agreement

Classroom Attendance Requirement	None Unless otherwise agreed upon, presence at the laboratories is mandatory
Learning material	
Comments	