

Module Handbook (<https://modhb.uni-kl.de/>)

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Module EIT-EIS-571-M-4

Architecture of Digital Systems I (M, 4.0 LP)

Module Identification

Module Number	Module Name	CP (Effort)
EIT-EIS-571-M-4	<i>Architecture of Digital Systems I</i>	4.0 CP (120 h)

Basedata

CP, Effort	4.0 CP = 120 h
Position of the semester	1 Sem. in WiSe
Level	[4] Bachelor (Specialization)
Language	[EN] English
Module Manager	Kunz, Wolfgang, Prof. Dr.-Ing. (PROF DEPT: EIT) (/staff/344/)
Lecturers	Kunz, Wolfgang, Prof. Dr.-Ing. (PROF DEPT: EIT) (/staff/344/)
Area of study	[EIT-EIS] Electronic Design Automatization
Lifecycle-State	[NORM] Active

Courses

Type/SWS	Course Number	Choice in Module-Part	SL	PL	CP	Sem.
2V+1U	EIT-EIS-571-K-4 (/mhb/courses/EIT-EIS-571-K-4)	P	-	PL1	4.0	WiSe

- About [EIT-EIS-571-K-4]: Title: "Architecture of Digital Systems I"; Presence-Time: 42 h; Self-Study: 78 h

Examination achievement PL1

- Form of examination: **oral examination (30 Min.)**
- Examination Frequency: each semester

Evaluation of grades

The grade of the module examination is also the module grade.

Contents

From [EIT-EIS-571-K-4] Architecture of Digital Systems I (/mhb/courses/EIT-EIS-571-K-4/):

- Data representation
 - Signed and unsigned fixed point numbers
 - Floating point numbers, IEEE 754 standard
- Computer arithmetic
 - Algorithms
 - Sequential and parallel hardware implementations
- Instruction set and machine language
 - Instruction set categories
 - Addressing modes
 - Assembler programming
- Data path and control
 - Hardware implementation of a processor
 - Control unit design, microprogramming
 - Exceptions
- Instruction-level parallelism
 - Pipelining
 - Superscalar and VLIW processors
 - Dynamic scheduling
- Memory hierarchy
 - Caches
 - Virtual memory, page tables, TLB

Competencies / intended learning achievements

After completing this module you can...

- ... identify and describe a RISC instruction set architecture (ISA) for embedded processors.
- ... explain the purpose, working principles and interrelation of the components of an embedded processor core.
- ... relate features of the ISA to internal structures of the processor hardware.
- ... classify and explain principles of instruction level parallelism.
- ... explain the working principles, general architecture of a processor's memory hierarchy.
- ... devise the general hardware for embedded processors at the block diagram level.

Requirements for attendance (informal)

Modules:

- [EIT-EIS-314-M-2] Fundamentals of Information Processing (M, 6.0 LP) (/mhb/modules/EIT-EIS-314-M-2/)

Requirements for attendance (formal)

None

References to Module / Module Number [EIT-EIS-571-M-4]

Course of Study	Section	Choice/Obligation
[EIT-82.781-SG#2019] B.Sc. Electrical and Computer Engineering [2019] (/mhb/FB-EIT/cos-523/)	Major-Specific Advanced Subjects	[P] Compulsory
[EIT-82.781-SG#2019] B.Sc. Electrical and Computer Engineering [2019] (/mhb/FB-EIT/cos-523/)	Major-Specific Advanced Subjects	[P] Compulsory
[EIT-88.781-SG#2010] M.Sc. Electrical and Computer Engineering [2010] (/mhb/FB-EIT/cos-556/)	Specialization Modules	[P] Compulsory
[EIT-88.A44-SG#2018] M.Sc. Media and Communication Technology [2018] (/mhb/FB-EIT/cos-568/)	Technical Elective Subjects	[W] Elective Module
[EIT-82.?-SG#2021] B.Sc. Electrical and Computer Engineering [2021] (/mhb/FB-EIT/cos-685/)	Major-Specific Advanced Subjects	[P] Compulsory
[EIT-82.?-SG#2021] B.Sc. Media and Communication Technology [2021] (/mhb/FB-EIT/cos-681/)	Technical Elective Modules	[W] Elective Module
[EIT-88.?-SG#2021] M.Sc. Media and Communication Technology [2021] (/mhb/FB-EIT/cos-688/)	Technical Elective Modules	[W] Elective Module
[EIT-88.A20-SG#2021] M.Sc. European Master in Embedded Computing Systems (EMECS) [2021] (/mhb/FB-EIT/cos-566/)	Core Subjects	[WP] Compulsory Elective
[EIT-88.?-SG#2021] M.Sc. Automation and Control (A&C) [2021] (/mhb/FB-EIT/cos-676/)	Elective Modules	[W] Elective Module
[EIT-88.?-SG#2021] M.Sc. Embedded Computing Systems (ESY) [2021] (/mhb/FB-EIT/cos-677/)	Core Program	[WP] Compulsory Elective
Module-Pool	Name	
[EIT-AUT-CAS-WP-MPOOL-7 (/mhb/modulepools/EIT-AUT-CAS-WP-MPOOL-7/)]	CAS Core Electives	
[GS-CVT-EE-E-MPOOL-6 (/mhb/modulepools/GS-CVT-EE-E-MPOOL-6/)]	Catalog Electives Electrical and Computer Engineering	