

Module Handbook

Technology and Management in Construction (Master of Science (M.Sc.), ER/SPO 2022)

Summer term 2024

Date: 05/03/2024

KIT DEPARTMENT OF CIVIL ENGINEERING, GEO AND ENVIRONMENTAL SCIENCES



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This handbook version is for informational use only. For legally binding information, please refer to the German version of this handbook.

1 Preliminary remarks

The module handbook is the document in which important additional information about the studies is described. General examination regulation rules (see <https://www.sle.kit.edu/english/vorstudium/master-technology-management-construction.php>; *in German*) and the program structure are specified by the curriculum (Chapt. 2). The main function of the Module Handbook is the compilation of module descriptions (Chapt. 5) and learning controls (Chapt. 6).

In addition to the module handbook, information on the individual courses (type, content, language, etc.) is in the [online course catalog](#). For links to the courses (online) see the learning controls (Chapt. 6). The course language is indicated in the module tables (Chapt. 2) and partly in the course catalog (online). Information on the examinations in the current semester is provided via the portal Campus Management for Students and via notices and on the institutes' web pages as well.

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2 Curriculum

This section describes the additional 'Curriculum' rules to the examination and study regulation (ER/SPO), also available online:

https://www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2022_AB_044.pdf

(2022 KIT 044 Studien- und Prüfungsordnung des Karlsruher Instituts für Technologie (KIT) für den Masterstudiengang Technologie und Management im Baubetrieb; *in German*)

https://www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2023_AB_029.pdf

(2023 KIT 029 Satzung zur Änderung der Regelung über die mündliche Nachprüfung in den Studien- und Prüfungsordnungen des Karlsruher Institut für Technologie (KIT), Artikel 71; *in German*)

2.1 Objectives of the master degree program

The graduates of the master degree program 'Technology and Management in Construction' (TMB) at Karlsruhe Institute of Technology (KIT) supplemented and deepened their scientific qualifications obtained in the bachelor degree program. They independently learned to apply their scientifically founded and interdisciplinary knowledge and methods in the fields of system analysis, process development, life cycle and project management across disciplines and to assess the importance and scope for the solution of complex scientific and societal problems. Consequently, they can develop innovative problem solutions beyond the application of established constructional rules and enter new technological territory. Furthermore, they can develop macroeconomic as well as socially and environmentally compatible solutions for the increasing complexity of these tasks. The graduates have the ability to work interdisciplinary, to describe technically complex facts understandably and have a convincing manner, which also prepares them very well for managerial tasks, including interdisciplinary teams.

In particular, the graduates can purposefully apply their deepened knowledge of project and process management, of construction process engineering and construction economics as well as their methodological knowledge in project development, facility management and environmental protection to solve complex tasks. With their comprehensive understanding of the legal, economic and technical relationships they are able to realize, operate and dismantle buildings of all kinds in an optimal way - and under the newest requirements of the digitalization in the construction industry.

2.2 Structure of the master degree program

The master degree program 'Technology and Management in Construction' comprises 120 credit points (CP). It is subdivided into a compulsory elective block, the **Profile Studies** (66 CP), a compulsory block, the **Supplementary Studies** (24 CP), and the **Master's Thesis** (30 CP). In the Profile Studies one of the following **Study Profiles** must be selected:

- I. Site Management and Production Methods
- II. Project Management and Lean Construction
- III. Real Estate and Facility Management
- IV. Digital Technologies in Construction
- V. People and Environment in Construction

These study profiles focus on a specific field and are defined by the corresponding modules (s. Tab. 1 - 5) assigned according to the different characteristics of the professional profile. Each profile consists of two compulsory elective subjects. In the one compulsory elective subject (24 CP) four specific **basic modules** are predefined. The other compulsory elective subject (42 CP) is characterized by the corresponding module catalog with the **specialization modules**. All modules in the master degree program are integrated into these study profiles and normally comprise 6 CP. Modules imported from other study programs comprise between 3 and 9 CP. Most of the modules are assigned to several profiles.

The Supplementary Studies comprise the two compulsory subjects **Subject-Specific Supplements** (18 CP) and **Interdisciplinary Qualifications** (6 CP). Within the subject Subject-Specific Supplements, all modules not yet selected or predefined (depending on selected profile) can be chosen freely as **Supplementary Modules**. Interdisciplinary qualifications can be obtained in courses from the corresponding course catalog on key competences offered by the House of Competence (HoC) or from the Centre for Cultural and General Studies (ZAK) or in language courses at the 'Sprachzentrum' (SpZ, center of language studies). These courses are freely selectable.

Beside field trips as part of several courses some one-day excursions take place annually, e.g. at the beginning of the winter term as 'Herbstexkursion'. In addition, the Institute of Technology and Management in Construction (TMB) annually offers a one big several-day excursion in the week after Whitsun, which all students should attend once. The single attendance of a TMB one- or several-day excursion is compulsory for each student in the master degree program 'Technology and Management in Construction'.

1. Sem.	2. Sem.	3. Sem.	4. Sem.
Profile Studies (compulsory elective)			Master's Thesis 30 LP duration of preparation: 6 months completion by presentation
selected Study Profile: 24 CP Site Management and Production Methods - Basics (P 1) Project Management and Lean Construction - Basics (P 2) Real Estate and Facility Management - Basics (P 3) Digital Technologies in Construction - Basics (P 4) People and Environment in Construction - Basics (P 5) 4 modules with 6 CP predefined			
selected Study Profile: 42 CP Site Management and Production Methods - Specialization (P 1) Project Management and Lean Construction - Specialization (P 2) Real Estate and Facility Management - Specialization (P 3) Digital Technologies in Construction - Specialization (P 4) People and Environment in Construction - Specialization (P 5) modules selectable from the listed offer			
Supplementary Studies (compulsory)			
Subject-Specific Supplements: 18 CP subject-specific modules freely selectable			
Interdisciplinary Qualifications 6 CP (selectable from the offer of HoC, ZAK and SpZ)			
Additional Studies			
Additional Accomplishments: max. 30 CP freely selectable from the entire course offer of KIT			

2.2.1 Profile 'Site Management and Production Methods' (P1)

The graduates can describe their scientific knowledge about technical, economic and organizational tasks of construction site management from the commission to the final acceptance. They are thereby able to analyze and evaluate the individual production steps. Furthermore, the students are able to describe and analyze the construction and function of construction machines and constructional procedures. They can select and assemble devices, equipment and production techniques adapted to the construction task. They can recognize optimization potentials as well as describe and dimension these by means of appropriate process technologies and methods.

Table 1: Modules in Profile Site Management and Production Methods

Module			Course				LC	
Code	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP
(tmb)					W	S		
Modules Site Management and Production Methods - Basics (predefined)								
M101:	Machinery and Process Engineering	6	Construction Equipment (G)	L	2		ngA wE	1 5
			Process Engineering (G)	L	2			
M501:	Environmentally-friendly Recycling and Disassembly of Buildings	6	Project Studies (G)	L/E		2	oE	6
			Disassembly Process Engineering (G)	L/E		2		
M102:	Technology and Production Methods in Turnkey Construction and Civil Engineering Works	6	Turnkey Construction (G)	L/E		2	wE	6
			Civil Engineering Structures and Regenerative Energies (G)	L/E		2		
M103:	Production Planning and Control in Construction	6	Site Management (G)	L		1	ngA wE	1 5
			Site Planning and Handling (G)	L/E		3		
sum basic modules		24			4	12		
Modules Site Management and Production Methods - Specialization (selectable)								
M111:	Advanced Studies in Construction Engineering	6	Tunnel Construction and Blasting Engineering (G)	L	2		wE	6
			Operation Methods for Foundation and Marine Construction (G)	L	1			
			Operation Methods for Earthmoving (G)	L	1			
M112:	Equipment and Special Construction Techniques in Building Practice	6	Equipment and Special Construction Techniques in Building Practice I (G)	L		2	oE	6
			Equipment and Special Construction Techniques in Building Practice II (G)	L	2			
M503:	Upgrading of Existing Buildings and Energetic Refurbishment	6	Upgrading of Existing Buildings (G)	L/E	3		EoT wE	1,5 4,5
			Energetic Refurbishment (G)	L	1			
M113:	Decommissioning of Nuclear Facilities	6	Removal and Decontamination of Nuclear Facilities (G)	L/E	2		oE	6
			New Development and Optimization of Decommissioning Machine Technology (G)	L/E	2			
M114:	Seminar Construction Machinery	6	Seminar Construction Machinery (G)	S/E		4	EoT	6
M611:	Building Preservation of Concrete and Masonry Constructions	6	Protection, Rehabilitation and Reinforcement of Concrete and Masonry Constructions (G)	L/E		2/1	ngA oE	1 5
			Building Analysis (G)	L		1		
M613:	Building Physics II	6	Practical Noise Control (G)	L		2	oE	3
			Practical Fire Protection (G)	L		2		
M201:	Project Management in Construction and Real Estate Industry	6	Project Management in Construction and Real Estate Industry (G)	L/E	4		ngA EoT	1 5
M502:	Leadership and Communication	6	Leadership and Communication (G)	L/E		4	wE	6
M202:	Lean Construction	6	Lean Construction (G)	L/E	4		EoT wE	1,5 4,5

(continuing next page)

Table 1: Modules in Profile Site Management and Production Methods (continued)

Module			Course				LC	
Code	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP
(tmb)					W	S		
M203:	Lean Integrated Project Delivery (Lean IPD)	6	Lean Integrated Project Delivery (G)	L/E		3	EoT wE	3 3
M402:	Building Information Modeling (BIM)	6	Building Information Modeling (BIM) (G)	L/E		4	EoT	6
M401:	Digital Engineering and Construction	6	Digital Engineering and Construction (E)	L/E	4		EoT	6
M211:	Research Seminar Construction Management	6	Research Seminar Construction Management I (G)	S		2	EoT	6
			Research Seminar Construction Management II (G)	S	2			
sum specialization modules		84			28	28		

explanations to Table 1:

in general:

LC learning control
 CP credit point
 HpW / SWS hours per week
 W / S winter term / summer term
 G / E language German / English

type of course:

L lecture
 L/E lecture and exercise,
 separate or integrated
 S seminar

type of learning control:

wE written examination
 oE oral examination
 EoT examination of other type
 ngA not graded accomplishment

2.2.2 Profile 'Project Management and Lean Construction' (P2)

The graduates have deepened knowledge in the field of project management, particularly in planning and controlling projects in construction and real estate industries. The students can name stakeholders, project structures and contract types in the field of project management and can analyze projects. They can apply methods and tools of project management in construction projects of all kinds. They can also describe and explain the theoretical principles of the lean philosophy and are able to identify and analyze problems in construction projects from the process perspective.

Table 2: Modules in Profile Project Management and Lean Construction

Module			Course				LC	
Code	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP
(tmb)					W	S		
Modules Project Management and Lean Construction - Basics (predefined)								
M201:	Project Management in Construction and Real Estate Industry	6	Project Management in Construction and Real Estate Industry (G)	L/E	4		ngA EoT	1 5
M202:	Lean Construction	6	Lean Construction (G)	L/E	4		EoT wE	1,5 4,5
M203:	Lean Integrated Project Delivery (Lean IPD)	6	Lean Integrated Project Delivery (G)	L/E		3	EoT wE	3 3
M502:	Leadership and Communication	6	Leadership and Communication (G)	L/E		4	wE	6
sum basic modules		24			8	8		
Modules Project Management and Lean Construction - Specialization (selectable)								
M102:	Technology and Production Methods in Turnkey Construction and Civil Engineering Works	6	Turnkey Construction (G)	L/E		2	wE	6
			Civil Engineering Structures and Regenerative Energies (G)	L/E		2		
M103:	Production Planning and Control in Construction	6	Site Management (G)	L		1	ngA wE	1 5
			Site Planning and Handling (G)	L/E		3		
M402:	Building Information Modeling (BIM)	6	Building Information Modeling (BIM) (G)	L/E		4	EoT	6
M303:	Sustainability in Real Estate Management	6	Sustainability in Real Estate Management (G)	L/E		3	wE	6
			Real Estate Life Cycle Management (G)	L		1		
M401:	Digital Engineering and Construction	6	Digital Engineering and Construction (E)	L/E	4		EoT	6
M811:	Entrepreneurship (EnTechnon)	6	Entrepreneurship ⁵⁾ (E)	L	2	2	wE	3
			Design Thinking ⁵⁾ (E)	S	2	2	EoT	3
M812:	Industrial Production I ^{2,3)}	9	Fundamentals of Production Management (G)	L/E		2/2	wE	5,5
			Logistics and Supply Chain Management ⁴⁾ (G)	L/E		2/1	wE	3,5
			Production Economics and Sustainability ⁴⁾ (G)	L	2		wE	3,5
M916:	Logistics and Supply Chain Management	9	Logistics and Supply Chain Management (G)	L		4	wE	9
M911:	Quality Management	4	Quality Management (G)	L	2		wE	4
M915:	Human-oriented Production ^{1,3)}	8	Human Factors Engineering I: Ergonomics (G)	L	2		wE	4
			Human-oriented Productivity Management: Personnel Management ^{4,5)} (G)	B	2	2	oE	4
			Productivity Management in Production Systems ⁴⁾ (G)	B		2	oE	4
M912:	Integrated Production Planning in the Age of Industry 4.0	8	Integrated Production Planning in the Age of Industry 4.0 (G)	L/E		6	oE	8

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Table 2: Modules in Profile Project Management and Lean Construction (continued)

Module			Course				LC	
Code	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP
(tmb)					W	S		
M913:	Constitutional and Administrative Law ¹⁾	6	Public Law I - Fundamentals (G)	L	2		wE	6
			Public Law II - Public Economic Law (G)	L		2		
M211:	Research Seminar Construction Management	6	Research Seminar Construction Management I (G)	S		2	EoT	6
			Research Seminar Construction Management II (G)	S	2			
sum specialization modules		86			20	43		

explanations to Table 2:

in general:

- LC learning control
 CP credit point
 HpW / SWS hours per week
 W / S winter term / summer term
 G / E language German / English
 1) Starting the module in winter term (W) is recommended.
 2) Starting the module in summer term (S) is recommended.
 3) In the module two learning controls have to be taken, one can be selected.
 4) Course with the related learning control can be selected.
 5) Course is offered every semester.

type of course:

- L lecture
 L/E lecture and exercise, separate or integrated
 S seminar
 B block course

type of learning control:

- wE written examination
 oE oral examination
 EoT examination of other type
 ngA not graded accomplishment

2.2.3 Profile 'Real Estate and Facility Management' (P3)

The graduates can distinguish between the prevailing alternatives of investment in property and apply financing models as well as established controlling tools in facility and real estate management. They are able to evaluate real estate by using different management procedures and can prepare expert opinions. In addition, the students have gained insight into project development of real estate by means of theoretical principles and case studies from the practice. They are enabled to solve problems in project development by themselves and conduct strategic planning.

Table 3: Modules in Profile Real Estate and Facility Management

Module			Course				LC	
Code	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP
(tmb)					W	S		
Modules Real Estate and Facility Management - Basics (predefined)								
M301:	Real Estate Management	6	Controlling in Real Estate Management (G)	L	1		wE	6
			Basics of Real Estate Valuation (G)	L	1			
			Corporate and Public Real Estate Management (G)	L	1			
			Project Development with Case Study (G)	L	1			
M302:	Facility Management	6	Facility and Service Management (G)	L/E	3		wE	6
			Facility and Real Estate Management II (G)	L/E	1			
M303:	Sustainability in Real Estate Management	6	Sustainability in Real Estate Management (G)	L/E		3	wE	6
			Real Estate Life Cycle Management (G)	L		1		
M503:	Upgrading of Existing Buildings and Energetic Refurbishment	6	Upgrading of Existing Buildings (G)	L/E	3		EoT wE	1,5 4,5
			Energetic Refurbishment (G)	L	1			
sum basic modules		24			12	4		
Modules Real Estate and Facility Management - Specialization (selectable)								
M404:	Digitalization in Facility and Real Estate Management	6	Digitalization in Facility and Real Estate Management (G)	L/E	4		EoT	6
M311:	Real Estate and Facility Management - on Site Lectures #)	6	Real Estate and Facility Management - on Site Lectures (G)	L/E		4	EoT	6
M313:	Agile Project Management in Facility and Real Estate Management	6	Agile Project Management in Facility and Real Estate Management (E)	L/E		4	EoT	6
M314:	Facility Management in Hospitals ²⁾	6	Facility Management in Hospitals (G)	L/E	4		EoT	6
M612:	Building Physics I	6	Applied Building Physics (G)	L	2		oE	3
			Building Technology (G)	L	2			
M613:	Building Physics II	6	Practical Noise Control (G)	L		2	oE	3
			Practical Fire Protection (G)	L		2		
M914:	Technical Energy Systems for Buildings ¹⁾	8	Technical Energy Systems for Buildings 1: Processes, Components (G)	L	2		oE	4
			Technical Energy Systems for Buildings 2: System Concept (G)	L		2		
M711:	Energy and Indoor Climate Concepts	4	Energy and Indoor Climate Concepts (G)	L		2	EoT	4
M611:	Building Preservation of Concrete and Masonry Constructions	6	Protection, Rehabilitation and Reinforcement of Concrete and Masonry Constructions (G)	L/E		2/1	ngA oE	1 5
			Building Analysis (G)	L		1		

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#) for this module specific preconditions are defined (see module description)

Table 3: Modules in Profile Real Estate and Facility Management (continued)

Module			Course				LC	
Code	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP
(tmb)					W	S		
M501:	Environmentally-friendly Recycling and Disassembly of Buildings	6	Project Studies (G)	L/E		2	oE	6
			Disassembly Process Engineering (G)	L/E		2		
M203:	Lean Integrated Project Delivery (Lean IPD)	6	Lean Integrated Project Delivery (G)	L/E		3	EoT wE	3 3
M201:	Project Management in Construction and Real Estate Industry	6	Project Management in Construction and Real Estate Industry (G)	L/E	4		ngA EoT	1 5
M402:	Building Information Modeling (BIM)	6	Building Information Modeling (BIM) (G)	L/E		4	EoT	6
M712:	Quarter Analysis	4	Quarter Analysis (G)	S	4		EoT	4
M713:	Urban Typologies	4	Urban Typologies (G)	S		2	EoT	4
sum specialization modules		86			22	34		

explanations to Table 3:

in general:

- LC learning control
 CP credit point
 HpW / SWS hours per week
 W / S winter term / summer term
 G / E language German / English
 1) Starting the module in winter term (W) is recommended.
 2) Module must not be selected together with the module M312 not offered anymore.

type of course:

- L lecture
 L/E lecture and exercise, separate or integrated
 S seminar

type of learning control:

- wE written examination
 oE oral examination
 EoT examination of other type
 ngA not graded accomplishment

2.2.4 Profile 'Digital Technologies in Construction' (P4)

The graduates can describe and apply digital methods and planning tools as well as theoretical principles of the different perspectives of the digitalization of buildings. They can also perform modeling steps as well as link the modeled structures with further information by themselves. The students can describe the different interests of the stakeholders in the context of digitalization in construction and are therefore able to collaborate in teams in the digital planning and construction processes with different stakeholders.

Table 4: Modules in Profile Digital Technologies in Construction

Module			Course				LC	
Code	Name	CP	Name (Language)	Type	HpW / SWS	Type	CP	
(tmb)					W S			
Modules Digital Technologies in Construction - Basics (predefined)								
M401:	Digital Engineering and Construction	6	Digital Engineering and Construction (E)	L/E	4		EoT	6
M402:	Building Information Modeling (BIM)	6	Building Information Modeling (BIM) (G)	L/E		4	EoT	6
M403:	Digital Technologies in Field Information Modeling	6	Digital Technologies in Field Information Modeling (E)	L/E		4	EoT	6
M404:	Digitalization in Facility and Real Estate Management	6	Digitalization in Facility and Real Estate Management (G)	L/E	4		EoT	6
sum basic modules		24			8	8		
Modules Digital Technologies in Construction - Specialization (selectable)								
M201:	Project Management in Construction and Real Estate Industry	6	Project Management in Construction and Real Estate Industry (G)	L/E	4		ngA EoT	1 5
M202:	Lean Construction	6	Lean Construction (G)	L/E	4		EoT wE	1,5 4,5
M614:	Digital Planning and Building Information Modeling	6	Digital Planning and Building Information Modeling (G)	L/E	4		EoT	6
M615:	Models and Methods in Traffic Engineering and Transportation Planning	6	Methods and Models in Transportation Planning (G)	L/E	2		oE	6
			Traffic Engineering (G)	L/E	2			
M616:	Traffic Management and Simulation Methods	6	Traffic Management and Transport Telematics (G)	L/E		2	oE	6
			Traffic Flow Simulation (G)	L/E		2		
M617:	2D/3D Image Analysis and Image based Tracking Methods	6	2D Computer Vision (G)	L	1		oE	3
			3D Computer Vision (G)	L	2			
			Image Sequence Analysis (G)	L	2			
CC933:	Introduction to GIS for Students of Natural, Engineering and Geo Sciences	6	Introduction to GIS for Students of Natural, Engineering and Geo Sciences (G)	L/E	4		ngA ⁶⁾ wE	3 3
M815:	Foundations of Informatics I	5	Foundations of Informatics I (G)	L/E		2/2	wE	5
M816:	Foundations of Informatics II	5	Foundations of Informatics II (G)	L	3		wE	5
M817:	Introduction to Programming	5	Introduction to Programming with Java (G)	L/E	3/2		wE	5

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Table 4: Modules in Profile Digital Technologies in Construction (continued)

Module			Course				LC	
Code	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP
(tmb)					W	S		
M818:	Applied Informatics ^{1,3)}	9	Advanced Programming - Java Network Programming (G)	L/E		2/2	wE	4,5
			Applied Informatics – Applications of Artificial Intelligence ⁴⁾ (G)	L/E	2/1		wE	4,5
			Applied Informatics – Database Systems ⁴⁾ (G)	L/E		2/1	wE	4,5
			Applied Informatics – Information Security ⁴⁾ (G)	L/E		2/1	wE	4,5
			Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services ⁴⁾ (D)	V/Ü		2/1	wE	4,5
			Applied Informatics – Modelling ⁴⁾ (G)	L/E	2/1		wE	4,5
			Applied Informatics – Software Engineering ⁴⁾ (G)	L/E		2/1	wE	4,5
M813:	Digital Service Systems ^{3a)}	9	Service Innovation ⁴⁾ (E)	L		2	wE	4,5
			Operations Research in Supply Chain Management ⁴⁾ (E)	L/E	2/1		wE	4,5
			Operations Research in Health Care Management ⁴⁾ (E)	L/E	2/1		wE	4,5
M917:	Virtual Engineering Construction - A ^{1,3)}	8	Virtual Engineering I (E)	L/E	2/2		wE	4
			Business Administration for Engineers and IT professionals ^{4,5)} (G)	S	2	2	EoT	4
			IoT Platform for Engineering ^{4,5)} (G)	Pj	3	3	EoT	4
			PLM-CAD Workshop ^{4,5)} (G)	Pj	4	4	EoT	4
			PLM for Product Development in Mechatronics ^{4,5)} (G)	L	2	2	oE	4
			Virtual Engineering Lab ^{4,5)} (G/E)	Pj	3	3	EoT	4
			Virtual Training Factory 4.X ^{4,5)} (G)	S/P	2	2	EoT	4
M918:	Virtual Engineering Construction - B ^{2,3)}	8	Virtual Engineering II (E)	L/E		3	wE	4
			Business Administration for Engineers and IT professionals ^{4,5)} (G)	S	2	2	EoT	4
			IoT Platform for Engineering ^{4,5)} (G)	Pj	3	3	EoT	4
			PLM-CAD Workshop ^{4,5)} (G)	Pj	4	4	EoT	4
			PLM for Product Development in Mechatronics ^{4,5)} (G)	L	2	2	oE	4
			Virtual Engineering Lab ^{4,5)} (G/E)	Pj	3	3	EoT	4
			Virtual Training Factory 4.X ^{4,5)} (G)	S/P	2	2	EoT	4
sum specialization modules		91			53	27		

explanations to Table 4:

in general:

LC	learning control
CP	credit point
HpW /	
SWS	hours per week
W / S	winter term / summer term
G / E	language German / English
1)	Starting the module in winter term (W) is recommended.
2)	Starting the module in summer term (S) is recommended.
3)	In the module two learning controls have to be taken, one can be selected.
3a)	In the module two learning controls have to be taken, both can be selected.
4)	Course with the related learning control can be selected.
5)	Course is offered every semester.

type of course:

L	lecture
L/E	lecture and exercise, separate or integrated
S	seminar
S/P	seminar/practical course integrated
Pj	project

type of learning control:

wE	written examination
oE	oral examination
EoT	examination of other type
ngA	not graded accomplishment
ngA ⁶⁾	not graded accomplishment as examination prerequisite

2.2.5 Profile 'People and Environment in Construction' (P5)

The graduates can independently name and identify interventions and the impact of the construction industry on climate and environment. They are able to analyze environmental issues related to building, operation and removal of buildings of all kinds and to apply appropriate methods and tools for reducing and avoiding harmful impact on humans, animals, soil, resources, energy, immissions, climate and ecosystems. Furthermore, the students are able to recognize and explain the influence of social aspects on the realization of construction projects as well as on the later use of the building. In addition, they can describe their knowledge of the principles of communication as well as analyze and apply methods of personal management and conflict resolution.

Table 5: Modules in Profile People and Environment in Construction

Module			Course				LC	
Code (tmb)	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP
					W	S		
Modules People and Environment in Construction - Basics (predefined)								
M303:	Sustainability in Real Estate Management	6	Sustainability in Real Estate Management (G)	L/E		3	wE	6
			Real Estate Life Cycle Management (G)	L		1		
M501:	Environmentally-friendly Recycling and Disassembly of Buildings	6	Project Studies (G)	L/E		2	oE	6
			Disassembly Process Engineering (G)	L/E		2		
M502:	Leadership and Communication	6	Leadership and Communication (G)	L/E		4	wE	6
M503:	Upgrading of Existing Buildings and Energetic Refurbishment	6	Upgrading of Existing Buildings (G)	L/E	3		EoT wE	1,5 4,5
			Energetic Refurbishment (G)	L	1			
sum basic modules		24			4	12		
Modules People and Environment in Construction - Specialization (selectable)								
M620:	Environmental Communication	6	Environmental Communication ⁴⁾ (G)	S	2	2	ngA ⁵⁾ EoT	0 6
M202:	Lean Construction	6	Lean Construction (G)	L/E	4		EoT wE	1,5 4,5
M621:	Urban Renewal	6	Urban Management *) (G)	L/E	2	(2)	oE wE	3 3
			History of Urban Planning (G)	L		2		
M622:	Environmental Geotechnics	6	Landfills (G)	L/E	2		oE oE	3 3
			Brownfield Sites - Investigation, Evaluation, Rehabilitation (G)	L	2			
M613:	Building Physics II	6	Practical Noise Control (G)	L		2	oE oE	3 3
			Practical Fire Protection (G)	L		2		
M113:	Decommissioning of Nuclear Facilities	6	Removal and Decontamination of Nuclear Facilities (G)	L/E	2		oE	6
			New Development and Optimization of Decommissioning Machine Technology (G)	L/E	2			
CC933:	Introduction to GIS for Students of Natural, Engineering and Geo Sciences	6	Introduction to GIS for Students of Natural, Engineering and Geo Sciences (G)	L/E	4		ngA ⁵⁾ wE	3 3
M914:	Technical Energy Systems for Buildings ¹⁾	8	Technical Energy Systems for Buildings 1: Processes, Components (G)	L	2		oE oE	4 4
			Technical Energy Systems for Buildings 2: System Concept (G)	L		2		
M711:	Energy and Indoor Climate Concepts	4	Energy and Indoor Climate Concepts (G)	L		2	EoT	4

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*) Course is offered exceptionally not in summer term 2024 but in winter term 2024/25.

Table 5: Modules in Profile People and Environment in Construction (continued)

Module			Course				LC	
Code	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP
(tmb)					W	S		
M814:	Environmental Emissions and Life Cycle Assessment	7	Emissions into the Environment (G)	L	2		wE	3,5
			Life Cycle Assessment and Global Forecasts (G)	L	2		wE	3,5
M913:	Constitutional and Administrative Law ¹⁾	6	Public Law I - Fundamentals (G)	L	2		wE	6
			Public Law II - Public Economic Law (G)	L		2		
M619:	Environmental Law	3	Environmental Law (G)	L	2		wE	3
M712:	Quarter Analysis	4	Quarter Analysis (G)	S	4		EoT	4
M713:	Urban Typologies	4	Urban Typologies (G)	S		2	EoT	4
M915:	Human-oriented Production ^{1,2)}	8	Human Factors Engineering I: Ergonomics (G)	L	2		wE	4
			Human-oriented Productivity Management: Personnel Management ^{3,4)} (G)	B	2	2	oE	4
			Productivity Management in Production Systems ³⁾ (G)	B		2	oE	4
sum specialization modules		86			38	20		

explanations to Table 5:

in general:

- LC learning control
 CP credit point
 HpW / SWS hours per week
 W / S winter term / summer term
 G / E language German / English
 1) Starting the module in winter term (W) is recommended.
 2) In the module two learning controls have to be taken, one can be selected.
 3) Course with the related learning control can be selected.
 4) Course is offered every semester.

type of course:

- L lecture
 L/E lecture and exercise, separate or integrated
 S seminar
 B block course

type of learning control:

- wE written examination
 oE oral examination
 EoT examination of other type
 ngA⁵⁾ not graded accomplishment as examination prerequisite

2.3 Mentoring, module selection, individual curriculum

The selection options within the studies require that each student must compile an individual curriculum. This includes selecting one of the three study profiles with the corresponding modules and selecting modules within the Supplementary Studies (supplementary modules). This selection has to be supervised by a **mentor** chosen by the student (comp. ER/SPO § 17 a). The mentor has to be a professor of the KIT Department Civil Engineering, Geo and Environmental Sciences and to be involved with one module in the selected profile. Possible mentors are:

- Profile 1: Prof. S. Haghsheno, Prof. S. Gentes, Prof. K. Lennerts, Jun.-Prof. R. Maalek
- Profile 2: Prof. S. Haghsheno, Prof. K. Lennerts, Jun.-Prof. R. Maalek
- Profile 3: Prof. K. Lennerts, Prof. S. Gentes, Prof. S. Haghsheno
- Profile 4: Jun.-Prof. R. Maalek, Prof. K. Lennerts, Prof. S. Haghsheno
- Profile 5: Prof. S. Haghsheno, Prof. K. Lennerts, Prof. S. Gentes

The selected profile determines the four **basic modules**. The **specialization modules** are chosen from the corresponding module catalog (see Tab. 1 - 5) to the extent of at least 42 CP. Within the Supplementary Studies subject-specific modules to the extent of at least 18 CP are selected freely from the master degree program 'Technology and Management in Construction' or any related program.

The form for selecting modules within the study profiles and the supplementary studies is available on the Examination Committee Master Civil Engineering web page, <https://www.tmb.kit.edu/english/5583.php> (*in German*). This has to be filled in by the student, signed by both student and mentor, and forwarded to the [study program coordinator](#) via the mentor for it to be entered into the Campus Management System. The modules must be entered in time to register for the exams in the first semester of the master degree program (comp. ER/SPO § 19 Par. 4). This ensures that the examination management (registration, deregistration if applicable, booking results etc.) can be processed smoothly. The individual curriculum is accessible at any time via the portal Campus Management for Students, <https://campus.studium.kit.edu/english/index.php>.

The modules should be chosen with care. Firstly, the assignment of the modules to the corresponding part of the program, Profile Studies or Supplementary Studies respectively, is later transferred to the master degree certificate. Secondly, changes in the module selection have to be in agreement with the selected mentor and should be limited to exceptional cases only, e.g. if a compulsory elective module is not offered at short notice. As long as the corresponding module has not yet begun, changes to the module selection are generally possible.

2.4 Interdisciplinary qualifications

Students compile their own module **Interdisciplinary Qualifications** (comp. ER/SPO § 15a) to an extent of 6 CP from the offers on key competences of the KIT House of Competence (HoC) as well as the Centre for Cultural and General Studies (ZAK), from the offer of General Studies at ZAK or language courses at the 'Sprachenzentrum' (STK, center of language studies). All courses from the civil engineering programs offered by ZAK as key competences or in the General Studies are excluded. Courses accepted generally by the Examination Committee can be selected directly in the module. In special cases, the [Examination Committee Master Civil Engineering](#) can permit or approve further suitable courses as interdisciplinary qualifications beyond the mentioned options. This requires the mentor's support.

Registering for courses on key competences of HoC and ZAK as well as the language courses of SpZ takes place directly at HoC, ZAK or SpZ. The examinations results are typically uploaded as 'Not assigned grades'. The students can **assign them in two steps**. Firstly, they **select** the corresponding 'Teilleistung' with the title 'Self Assignment HoC-ZAK-SpZ ...' in the module Interdisciplinary Qualifications according to the grading scale, not graded or graded. Then, they **assign** the corresponding not assigned exam to one of the selected 'Teilleistungen'. The title and credit points are automatically transferred from the exam when credited. To credit exams that could not be assigned by oneself, the form [assignment of non-assigned activity statements](#) (*in German*) has to be submitted to the [Study Program Service](#) of the department.

Registering for a learning control takes place online for courses offered by General Studies of ZAK or other courses accepted by the [Examination Committee Master Civil Engineering](#). The [Study Program Service](#) of the department has to be informed in time, so that the corresponding learning control can be selected in the campus management system within the registration period. Approval has to be provided for the courses accepted by the [Examination Committee Master Civil Engineering](#).

The module Interdisciplinary Qualifications is completed non-graded. A grade can be disclosed in consultation with the lecturer but is not included in the calculation of the module grade.

2.5 Begin and complete a module

Every module and every examination is allowed to be credited once only (comp. ER/SPO § 7 Par. 5). The binding decision whether a module is selected is made by the student at the time of registering for the corresponding examination or partial examination (comp. ER/SPO § 5 Par. 2). The student can revoke this binding selection by deregistering in time. After attending the examination, especially a partial examination, a module cannot be replaced by another one any more. The assignment can be changed on request to the [Examination Committee Master Civil Engineering](#).

A module is **completed** if the general examination of the module has been passed (grade min. 4.0). If a module examination consists of several partial examinations, then the module is completed if all partial examinations are passed (grade min. 4.0) and the minimum credit requirements of this module are met.

2.6 Registration, deregistration, repetition of examinations

Registration for examinations, not graded accomplishments and examination prerequisites takes place online via the portal Campus Management for Students, <https://campus.studium.kit.edu/english/index.php>. After logging in students can:

- register and deregister for examinations
- retrieve examination results
- assign key competences of HoC, ZAK, SpZ by themselves
- print a transcript of records

A successful online registration covers the admission to the examination. The portal Campus Management for Students provides the confirmation, which can serve as proof of registration in case of doubt. If problems occur with an online registration, the [Study Program Service](#) of the department as well as the examiner have to be informed as soon as possible to solve the problem in advance of examination date. In the case of an oral examination, the online registration has directly to be combined with the negotiation of an examination date with the examiner.

A registered examination either has to be taken or **deregistered** in advance of the deregistration deadline. This also applies if the date for an oral examination is moved to the following semester as the examinations are managed for each semester individually. The rules for deregistering from an examination are set by the ER/SPO § 10. Deregistration from examinations of other kinds as well as from not graded accomplishments (ER/SPO § 10 Par. 3) must be done by the deadline for the submission or presentation at the latest.

Generally, a failed examination can be repeated once, at the latest by the end of the examination period of the next but one semester to this examination (comp. ER/SPO § 8). If a written repeat examination is failed, a specific oral repeat examination can be taken. This is part of the repeat examination and will not be evaluated independently. After the specific oral repeat examination the overall grade of the repeat examination is either grade 4.0 (passed) or grade 5.0 (failed).

If the **repeat examination** (including a specific oral repeat examination) is failed as well, the **entitlement to the examination** is lost. A potential request for a **second repetition** has to be made without delay after loosing the examination entitlement. Requests for a second repetition of an examination (see <https://www.tmb.kit.edu/english/5583.php>; *in German*) require the approval of the [Examination Committee Master Civil Engineering](#). A counseling interview is mandatory. The second repetition is registered at the [Study Program Services](#) by submitting the approval. As long as the second repetition of the exam has not been passed, further exams can only be taken with reservation. Also, such exams with reservation are registered at the [Study Program Services](#) by submitting the approval.

Further information is available in the examination and study regulation (ER/SPO, <https://www.sle.kit.edu/english/vorstudium/master-technology-management-construction.php>; *in German*), and from the [Examination Committee Master Civil Engineering](#) or the 'Fachschaft' (student council).

2.7 Students in special circumstances

Students in special circumstances are students with disabilities or chronic diseases, or on maternity leave, with children or dependents in need of care. The regulations on compensation for disadvantages include preferential access to courses with limited attendance, taking examinations under individually designed conditions, or adjustments to deadlines. These are described in detail in the [Satzung über nachteilsausgleichende Regelungen in den Bachelor- und Masterstudiengängen am Karlsruher Institut für Technologie \(KIT\)](#) (*in German*; see SPO § 12 and 13).

For compensation for a disadvantage, the student should submit an informal application to the [Examination Committee Master Civil Engineering](#) and provide the appropriate proof. The [Examination Committee Master Civil Engineering](#) decides on the application as well as on the kind and extent of the individually necessary measures and informs the student.

2.8 Crediting and recognition of already obtained accomplishments

In general, accomplishments already obtained can be recognized under the conditions of the ER/SPO (comp. ER/SPO § 18). The recognition has to be made with the corresponding recognition form of the [Examination Committee Master Civil Engineering](#) (<https://www.tmb.kit.edu/english/5583.php>; *in German*). It must unambiguously state at which place in the curriculum the recognized accomplishment is to be credited.

If the accomplishments are mainly **identical** with modules from the curriculum (name, objectives, content) the respective lecturer confirms this on the form.

If the accomplishments are **not identical** with modules from the curriculum they can be recognized as well, if the obtained competences contribute to achieve the qualification goals of the study program. These are included into the individual curriculum in agreement with the mentor. The [Examination Committee Master Civil Engineering](#) decides in these cases. Usually, modules to the extent of max. 12 CP can be credited for Subject-Specific Supplements. Additional credit points are dropped.

The recognition form has to be submitted to the [Examination Committee Master Civil Engineering](#), which then transfers the creditable accomplishments.

Recognizing accomplishments obtained **outside the higher education system** is possible if the obtained competences contribute to achieving the qualification goals of the study program. For this purpose, an informal request has to be sent to the [Examination Committee Master Civil Engineering](#) and a counseling interview has to be arranged. Then, the [Examination Committee Master Civil Engineering](#) examines to which extent the obtained knowledge and skills can be recognized and which parts of the higher education study can be replaced by them. No more than than 50 % of the higher education study can be replaced. These accomplishments are to be included in the individual curriculum in agreement with the mentor.

For crediting passed **prior master's examinations** the form [Transfer of prior master's examinations](#) (*in German*) has to be filled and transferred to the [Study Program Service](#) of the department.

Further information about recognitions is on the Examination Committee Master Civil Engineering (<https://www.tmb.kit.edu/english/PAM.php>) web page.

2.9 Admission, preparation and completion of the master's thesis

The **Master's Thesis** is usually carried out in the fourth semester in the selected profile (comp. ER/SPO § 14). The topic of the master's thesis has to be assigned by a professor of the KIT Department of Civil Engineering, Geo- and Environmental Sciences. A topic assigned by a person who is not member of the KIT Department of Civil Engineering, Geo- and Environmental Sciences needs permission of the [Examination Committee Master Civil Engineering](#) using the corresponding form (see <https://www.tmb.kit.edu/english/5583.php>; *in German*). Students' wishes can be considered when drafting the topic. If the master's thesis is written outside of KIT, consider the instructions on 'Merkblatt - Externe Abschlussarbeiten' (http://www.haa.kit.edu/downloads/KIT_ALLGEMEIN_Merkblatt_Externe_Abschlussarbeiten.pdf; *in German*).

Students are admitted to the master's thesis after successfully passing modules to an extent of a minimum 42 CP within the master program Technology and Management in Construction. Results obtained in the module Interdisciplinary Qualifications do not count for this purpose. The supervisor initiates the master's thesis to be uploaded to the campus management system. After notification via e-mail, the master's thesis has to be **registered online** in the portal Campus Management for Students. The **admission** follows after the required prerequisites and eventual further conditions are verified. As these steps have to be completed **before starting** the thesis (scheduled starting date), they should be initiated at least two weeks in advance.

The preparation time is six months. The master's thesis can be written in German or English. Within one month after submission it has to be completed with a **presentation** which is considered in the grading. It is highly recommended to have gained all technical and soft skills required to prepare the master's thesis topic in advance.

Further information about the processes related to the master's thesis can be found in "Handreichung Masterarbeiten Bauingenieurwesen" (*in German*) on the website of the Study Program Service under the link "[Abschlussarbeiten](#)".

2.10 Semester abroad

The department recommends students to study for one to two semesters at a foreign university. KIT offers a variety of exchange programs. Within Europe, this is the well-known ERASMUS program. General information on planning a stay abroad is available on the website of the International Student Office (IStO), <https://www.intl.kit.edu/ostudies/index.php>, and specific information is available on the website of the KIT-Department of Civil Engineering, Geo and Environmental Sciences, <https://bgu.kit.edu/english/outgoing.php>. It is compulsory to agree on the intended accomplishments with the personal mentor in advance particularly with regard to the possibility of crediting in the personal curriculum. The proposed Learning Agreement has to be approved and signed by the [Erasmus Coordinator](#).

2.11 Additional accomplishments

An **additional accomplishment** is a voluntary examination, which is not considered in the overall grade (comp. ER/SPO § 15). In total, additional accomplishments can be taken to the extent of max. 30 CP from offers within KIT.

The examination in the desired additional accomplishment should be registered online by the student within the registration period. Additional accomplishments available in the module [Further Examinations](#) can be selected directly. As from summer term 2023 two selectable additional modules are available for the Accompanying Studies of ZAK. If selecting one of these modules it has to be considered that the extent of possible further additional accomplishments is reduced by the extent of the selected ZAK module even if this is not completed. Designated additional accomplishments not available in the module [Further Examinations](#) or additional modules must be conveyed to the [Study Program Service](#) at the department via e-mail. The desired selection will then be made available in the campus management system enabling the online exam registration.

Usually, a passed additional accomplishment cannot be transferred subsequently to the individual curriculum. In special cases the [Examination Committee Master Civil Engineering](#) can approve an exception.

All additional accomplishments are listed in the transcript of records. Completed modules can be included in the master degree certificate as additional modules if requested by the student. This also applies to additional accomplishments recognized by the [Examination Committee Master Civil Engineering](#).

3 Further information

3.1 About the module handbook . . .

The **module handbook** is the key document describing the structure of the program, providing assistance and guidance during the study time. It contains the descriptions of all program modules and information on:

- the structure of the modules,
- the extent of the modules (in CP),
- the interdependencies between the modules,
- the learning outcomes of the modules,
- the type of assessment and examinations,
- the calculation of the module's grade, and
- the integration of the module in the course of study.

Each module consists of one or more interrelated courses, which are completed with one or more **examinations** or **not graded accomplishments**. With exception of some import modules, the modules comprise 6 CP, which will be credited after the module is successfully completed. The module handbook provides the necessary information for the students to customize the content and time schedule of their interdisciplinary studies according to personal needs, interest and job perspectives.

In addition to the module handbook, the **course catalog** and the institutes (web pages) provide important up-to-date information concerning variable course details (e.g. time and location of the course) as well as short-term modifications.

3.2 About module examinations, examination committee . . .

The module examinations are either a general examination or are split into several partial examinations. If the module examination is a **general examination**, the entire content of the module is reviewed in a single examination. If the module examination consists of **partial examinations**, the content of each course will be reviewed in corresponding partial examinations. Then, the module examinations can be spread out over several semesters. Not graded accomplishments can also be part of the module examination, e.g. as examination prerequisites.

The Examination Committee Master Civil Engineering (<https://www.tmb.kit.edu/english/PAM.php>) is responsible for all legal questions concerning examinations. Applications, e.g. for a second repetition, extension of deadlines or recognitions, must be submitted to this committee as it decides on and approves all requests.

3.3 About changes in the modules offered . . .

The range of modules changes in the course of the semesters. Modules may be discontinued or added or the module examination may change. When possible, such changes are announced in the module handbook with sufficient time in advance, at latest at the beginning of the semester they are valid from (see Chapt. [Current changes](#)).

As a rule, students who started a module (see selection and completion of a module) can complete it in the format it was started. The corresponding examinations are provided onwards over a certain time period usually at least one semester after it has changed. In general, a consultation with the examiner is recommended in such a case.

3.4 Contact persons

Dean of Study Affairs:

Prof. Dr.-Ing. Steffen Freitag
 Institute for Structural Analysis, Bldg. 10.50, 2nd floor
 consultation: on appointment
 Phone: 0721/608-42280
 Email: steffen.freitag@kit.edu

Study Program Coordination:

PD Dr. Ulf Mohrlök
 KIT Department of Civil Engineering, Geo and Environmental Sciences, Bldg. 10.81, R. 311
 consultation: on appointment
 Phone: 0721/608-46517
 Email: ulf.mohrlok@kit.edu

Examination Committee Master Civil Engineering:

Prof. Dr.-Ing. Kunibert Lennerts (chairperson)
 Dr.-Ing. Heike Schmidt-Bäumler (person in charge)
 Institute of Technology and Management in Construction, Bldg. 50.31, R. 005 (ground floor)
 consultation: on appointment
 Phone: 0721/608-46008
 Email: pam@bgu.kit.edu
 Web: <https://www.tmb.kit.edu/english/PAM.php>

Students' Advisory Service:

Dr.-Ing. Harald Schneider
 Institute of Technology and Management in Construction, Bldg. 50.31, R. 008 (ground floor)
 consultation: on appointment
 Phone: 0721/608-43881
 Email: harald.schneider@kit.edu

Study abroad:

Prof. Dr. Olivier Eiff (Erasmus Coordinator)
 Mrs. Angelika Fels (person in charge)
 Institute for Water and Environment, Bldg. 10.81, R. 128 (1st floor)
 consultation: on appointment
 Phone: 0721/608-47245
 Email: erasmus-civil@bgu.kit.edu
 Web: https://www.bgu.kit.edu/english/outgoing_erasmus.php

Study Program Service ('Studiengangservice Bau-Geo-Umwelt'):

KIT Department of Civil Engineering, Geo and Environmental Sciences, Bldg. 10.81, R. 312
 consultation: s. <http://www.bgu.kit.edu/english/studiengangservice.php>
 Email: studiengangservice@bgu.kit.edu
 Web: <http://www.bgu.kit.edu/english/studiengangservice.php>

Fachschaft:

Students in Civil Engineering
 Bldg. 10.81 (Altes Bauing. Geb.), R. 317.1 (3rd floor)
 consultation: s. <http://www.fs-bau.kit.edu>
 Phone: 0721/608-43895
 Email: info@fs-bau.kit.edu
 Web: <http://www.fs-bau.kit.edu>

3.5 Abbreviations, translations

CP/LP	credit points	Leistungspunkte
ER/SPO	examination regulations	Studien- und Prüfungsordnung
HpW/SWS	contact hour per week	Semesterwochenstunde
S	summer term	Sommersemester
Sem.	semester	Semester
W	winter term	Wintersemester

4 Current changes

Major changes will be listed here as from summer term 2024. Despite the fact that this process is mapped with great care, other/minor changes may occur.

changes of the courses assigned to the modules as from summer term 2024:

Urban Renewal [tmbM621]:

The course Urban Management (6231801), 2 HpW/SWS, will exceptionally not be offered in summer term 2024 but in winter term 2024/25.

5 Modules

M

5.1 Module: Machinery and Process Engineering (tmbM101) [M-BGU-100339]

Responsible: Prof. Dr.-Ing. Sascha Gentes
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Site Management and Production Methods](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	2

Mandatory			
T-BGU-100623	Machinery and Process Engineering	5 CR	Gentes
T-BGU-108012	Student Research Project 'Excavation Pit Development and Shuttering Planning'	1 CR	Schneider

Competence Certificate

- 'Teilleistung' T-BGU-108012 with not graded accomplishment according to § 4 Par. 3
 - 'Teilleistung' T-BGU-100623 with written examination according to § 4 Par. 2 No. 1
- details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

The students can name the basic principles and concepts of machine technology and are able to describe the built and function of construction machinery and equipment. They can appropriately name the equipment and select the suitable machines depending on their building tasks. They understand the BGL system (list of construction equipment) and are able to rank and classify machines and equipment as needed. They will realize optimization potentials using suitable process technology and equipment alternatives. Finally, they will be able to plan and size various construction machines and transport devices with respect to static and dynamic effects and impacts.

Content

This module provides machine technology basics to better understand a broad variety of construction equipment and machinery. Further, static and dynamic effects and impacts of construction equipment application will be discussed, various construction machines introduced, their respective applications compared, and basics for their dimensioning provided. Different construction machines and their variations will be presented with the help of the BGL system. In addition, the functions, variations, effectiveness, and applications for diverse construction and productions procedures used in processing technology, earthworks, underground engineering, and hydraulic engineering will be presented and discussed. The curriculum also includes the necessary technical basics for drive systems, power transmission components (mechanic and hydraulic), undercarriages, as well as steering controls, and safety facilities.

In addition to a building site visit for practical insight, a practical course on the institute's own test site will be offered to try out construction machinery. Finally, students need to develop two exercises within the scope of their seminar paper as part of this module.

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Construction Equipment lecture: 30 h
- Process Engineering lecture: 30 h

independent study:

- preparation and follow-up lectures Construction Equipment: 20 h
- preparation and follow-up lectures Process Engineering: 20 h
- preparation of student research project: 30 h
- examination preparation: 50 h

total: 180 h

Recommendation

none

Literature

- 1) Baugeräteliste, aktuelle Fassung
- 2) Hüster, Felix, Leistungsberechnung der Baumaschinen, Shaker, 5. Aufl., Aachen, 2005.
- 3) Girmscheid, Gerhard: Leistungsermittlungshandbuch für Baumaschinen und Bauprozesse, Springer Berlin Heidelberg, 2010.
- 4) Drees, Gerhard; Krauß, Siri: Baumaschinen und Bauverfahren - Einsatzgebiete und Einsatzplanung, expert-Verlag, 3., völlig neu bearb. Aufl., Renningen, 2002.

M

5.2 Module: Technology and Production Methods in Turnkey Construction and Civil Engineering Works (tmbM102) [M-BGU-105913]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Site Management and Production Methods](#)
[Project Management and Lean Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	4	2

Mandatory			
T-BGU-111899	Technology and Production Methods in Turnkey Construction and Civil Engineering Works	6 CR	Haghsheno

Competence Certificate

- 'Teilleistung' T-BGU-111899 with written examination according to § 4 Par. 2 No. 1

details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The students are able to describe and apply fundamental process and production methods, especially regarding to technical building services. Moreover, they are able to amplify fundamental processes in the subject area of turnkey construction and to analyze correspondent contexts and workflows.

Adding to this, the students are able to amplify essential elements of selected civil engineering structures and, regarding to this, comprehend typical production methods. Furthermore, the students are able to choose, amplify and analyze appropriate production methods for civil engineering structures.

Content

In the subject area of turnkey construction besides the detailed design of shell construction, technical support and technical building services, there is also an explanation of the related basic knowledge in engineering. Also, basics of the technical support belong to the curriculum, e.g., heating installations, ventilation systems, A/C, electric installations. Most of all, there is a focus on regenerative energies. Furthermore, the explanation of the processes in turnkey construction, from design and construction permit to final acceptance of work, is part of the lecture.

In the subject area of civil engineering structures and regenerative energies, besides basic knowledge in construction, there is also a focus on production methods for the construction and maintenance of the selected civil engineering structures. Adding to conventional construction methods there are topics like additive manufacturing in solid construction. This also includes the view on hydraulic constructions (e.g. water locks), waste disposal (e.g. waste disposal sites) and infrastructure constructions (e.g. steel composite bridge). Also, there is a focus on regenerative energies (e.g. wind power stations).

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Turnkey Construction lecture/exercise: 30 h
- Civil Engineering Structures and Regenerative Energies lecture/exercise: 30 h

independent study:

- preparation and follow-up lecture/exercises Turnkey Construction: 30 h
- preparation and follow-up lecture/exercises Civil Engineering Structures and Regenerative Energies: 30 h
- examination preparation: 60 h

total: 180 h

Recommendation

none

Literature

Bundesamt für Justiz (Hg.) (2020): Verordnung über die Honorare für Architekten- und Ingenieurleistungen (Honorarordnung für Architekten und Ingenieure - HOAI), Anlage 12

Patt, H; Speerli, J.; Gonsowski, P. (2021): Wasserbau. Grundlagen, Gestaltung von wasserbaulichen Bauwerken und Anlagen. Wiesbaden: Springer Fachmedien.

Bilitewski, B.; Härdtle, G. (2013): Abfallwirtschaft. Handbuch für Praxis und Lehre. Berlin/Heidelberg: Springer-Verlag.

Petzek, E.; Bancila, R. (2015): Economical Bridge Solutions based on innovative composite dowels and integrated abutments. Wiesbaden: Springer Fachmedien.

Hau, W. (2014): Windkraftanlagen. Grundlagen – Technik – Einsatz – Wirtschaftlichkeit. Berlin/Heidelberg: Springer-Verlag.

M

5.3 Module: Production Planning and Control in Construction (tmbM103) [M-BGU-105918]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Site Management and Production Methods](#)
[Project Management and Lean Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	4	2

Mandatory			
T-BGU-111901	Production Planning and Control in Construction	5 CR	Haghsheno
T-BGU-108010	Student Research Project 'Cost Estimation in Structural Engineering and Earthworks'	1 CR	Schneider

Competence Certificate

- 'Teilleistung' T-BGU-108010 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-111901 with written examination according to § 4 Par. 2 No. 1

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

The students can describe the essential technical, business, and organizational tasks of construction management from the order to acceptance and can analyze and evaluate the individual work steps. They can describe the fundamental processes of construction site planning and handling and assign suitable methods and tasks. Besides, they can design production systems for selected products from the construction industry and apply various techniques and methods for resource and logistics planning. Furthermore, the students can name the essential accident prevention regulations and can describe the active and passive protection measures as well as the organization of the labor protection. In addition, the students can develop approaches to solutions in the area of occupational safety on the basis of problem situations.

The students can explain the different methods of calculation and the structure of a calculation. They have the knowledge to create tenders and unit prices independently. Furthermore, students can apply current software for the calculation. Furthermore, the course clarifies, how to create, justify and calculate claims based on the VOB/B by using practical examples.

Students can explain the construction contract laws as well as the difference between BGB and VOB. Furthermore, students can explain the different types of procurement. The students are familiar with legal thinking regarding contract and employment law and can apply the basics to construction projects. Thereby, they can assess and evaluate the contents of a construction contract.

Content

The course site management presents the work of foreman, site manager, and project manager and contains significant aspects of management processes of the construction site. In addition to performance reporting, work costing and site management, the technical, legal and economic tasks of the site manager as well as communication and correspondence on the construction site will be highlighted. In addition, accident prevention regulations, active and passive protection measures as well as the organization of the labor protection during operation and on site are discussed.

The area of construction site planning and handling deals in more detail with various production systems and factors from the construction industry. Based on this, resource planning for the management of a construction site is dealt with in more detail. In addition to the resources of financial resources, machines and employees, logistics planning is also dealt with in more detail. In the context of resource planning, in-depth insights into costing are given and the topic of claim management, which deals with the handling of supplements, is also dealt with in particular. In the area of construction law, topics relating to the construction contract are dealt with. In addition, the areas of obstructions, liability and limitation periods are also addressed.

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Site Management lecture: 15 h
- Site Planning and Handling lecture/exercise: 45 h

independent study:

- preparation and follow-up lectures Site Management: 15 h
- preparation and follow-up lecture/exercises Site Planning and Handling: 30 h
- preparation of student research project: 30 h
- examination preparation: 45 h

total: 180 h

Recommendation

none

Literature

Elwert, Ulrich, Flassak, Alexander: Nachtragsmanagement in der Baupraxis - Grundlagen, Beispiele, Anwendung, Vieweg, 2., erw. und aktualisierte Aufl., Wiesbaden, 2008.

Berner, Fritz; Kochendörfer, Bernd; Schach, Rainer: Grundlagen der Baubetriebslehre 2 Baubetriebsplanung, Imprint: Springer Vieweg, Wiesbaden, 2013

Hofstadler, Christian: Bauablaufplanung und Logistik im Baubetrieb, Springer, Berlin, 2007

Schach, Rainer; Otto, Jens: Baustelleneinrichtung Grundlagen – Planung – Praxishinweise – Vorschriften und Regeln, Springer Fachmedien Wiesbaden GmbH, Wiesbaden, 2017

Drees, Gerhard; Paul, Wolfgang: Kalkulation von Baupreisen, Beuth Verlag GmbH, Berlin, 2015

Hauptverband d. Deutschen Bauindustrie/Zentralverband d. Deutschen Baugewerbes: Kosten-, Leistungs- und Ergebnisrechnung der Bauunternehmen, Rudolf Müller GmbH & Co. KG, Köln, 2016

M

5.4 Module: Advanced Studies in Construction Engineering (tmbM111) [M-BGU-100344]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Site Management and Production Methods](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	2

Mandatory			
T-BGU-108003	Advanced Studies in Construction Engineering	6 CR	Haghsheno

Competence Certificate

- 'Teilleistung' T-BGU-108003 with written examination according to § 4 Par. 2 No. 1
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The students are able to identify terms and modes of operations of specific construction equipment, combination of devices and special procedural systems in the subject areas earthwork and special underground engineering. They are able to understand and evaluate complex combinations of methods and processes with civil engineering works. Adding to this, they can identify the influence of outside influences to the selected devices and output-tool efficiency. Moreover, the students can amplify fundamental construction methods and construction designs of tunnels and galleries including the corresponding machines and devices as much as basic knowledge in blasting engineering.

Content

Earthwork and Underground Construction:

special equipment features and options of devices, mode of operation of the single devices and systems; process engineering of earthworks while mining, transportation, placing and compacting; influences on efficiency; soil improvement; quality control; transport and controls of devices and equipment; methods of underground construction, including special temporary pit supporting systems and foundations; underground improvements; injections; underpinning; tunneling; caisson construction; freezing of soil; quay walls; harbor constructions; statics of floating systems; support devices.

Tunnels and Blasting Engineering:

geological, rock mechanical and geotechnical parameters for underground constructions (tunnels and galleries, caves, etc.); project-related, process-related, and environmental influences; Machines and devices; special methods and advancements; selection criteria for proper tunnel methods; blasting engineering; explosive substances and blasting techniques; basic legal knowledge for blasting; study trip relating to blasting engineering.

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Tunnel Construction and Blasting Engineering lecture: 30 h
- Operation Methods for Foundation and Marine Construction lecture: 15 h
- Operation Methods for Earthmoving lecture: 15 h

independent study:

- preparation and follow-up lectures Tunnel Construction and Blasting Engineering: 30 h
- preparation and follow-up lectures Operation Methods for Foundation and Marine Construction: 15 h
- preparation and follow-up lectures Operation Methods for Earthmoving: 15 h
- examination preparation: 60 h

total: 180 h

Recommendation

none

M

5.5 Module: Equipment and Special Construction Techniques in Building Practice (tmbM112) [M-BGU-103918]

Responsible: Prof. Dr.-Ing. Sascha Gentes
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Site Management and Production Methods](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each term	2 terms	German	4	1

Mandatory			
T-BGU-108009	Equipment and Special Construction Techniques in Building Practice	6 CR	Gentes

Competence Certificate

- 'Teilleistung' T-BGU-108009 with oral examination according to § 4 Par. 2 No. 2
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The students can name the basic concepts of the presented construction equipment and special construction processes and are able to describe the structure and function of the devices and the procedures. Furthermore, they are able to assess the respective use of devices and processes and they know the current status of Technology of the treated areas.

Content

In this module, construction management basics of practical topics for work preparation and construction are taught. Various devices and special processes from different areas of construction, from formwork to construction and test methods, are presented and explained, especially with regard to innovative new features.

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Equipment and specific Methods in Construction I lecture: 30 h
- Equipment and specific Methods in Construction II lecture: 30 h

independent study:

- preparation and follow-up lectures Equipment and specific Methods in Construction I: 30 h
- preparation and follow-up lectures Equipment and specific Methods in Construction II: 30 h
- examination preparation: 60 h

total: 180 h

Recommendation

none

M

5.6 Module: Decommissioning of Nuclear Facilities (tmbM113) [M-BGU-100345]

Responsible: Prof. Dr.-Ing. Sascha Gentes
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Site Management and Production Methods](#)
[People and Environment in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	1

Mandatory			
T-BGU-100627	Decommissioning of Nuclear Facilities	6 CR	Gentes

Competence Certificate

- 'Teilleistung' T-BGU-100627 with oral examination according to § 4 Par. 2 No. 2
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The students can name the processes, equipments and machinery for decommissioning nuclear facilities. They can explain analytical methods for the procedure, the required techniques and processes for decommissioning and can develop decommissioning concepts. They are able to analyse self-reliantly decommissioning projects of nuclear facilities and to work in teams. They can prepare proposal for approval considering the respective laws.

Content

This course provides an overview about the state of research and technology in mechanical process engineering for the decommissioning of nuclear facilities. This involves decontamination procedures, remote-handled procedures, and procedures for the separation of reinforced concrete, etc.

The required approvals and licenses and the involved authorities will be introduced and discussed using examples and legal sources, e.g. the German Atomic Energy Act (Atomgesetz). The basics of radiation protection together with the pertaining measurement technology will be explained in step with actual practice. Furthermore, a suitable system to successfully manage decommissioning projects will be presented as well as the numerous stakeholders involved.

A visit to a nuclear facility currently under decommissioning is part of the course. The new findings will be further discussed in conjunction with existing decommissioning projects which will also be presented by the involved industry partners.

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Removal and Decontamination of Nuclear Facilities lecture, exercise: 30 h
- New Development and Optimization of Decommissioning Machine Technology lecture, exercise: 30 h

independent study:

- preparation and follow-up lectures, exercises Removal and Decontamination of Nuclear Facilities: 30 h
- preparation and follow-up lectures, exercises New Development and Optimization of Decommissioning Machine Technology: 30 h
- examination preparation: 60 h

total: 180 h

Recommendation

none

Literature

- 1) Kohli, Rajiv [Hrsg.]: Developments in surface contamination and cleaning - fundamentals and applied aspects, Knovel library, USA, 2008.
- 2) Rahman, A.: Decommissioning and radioactive waste management, Whittles, Dunbeath, 2008.
- 3) Thierfeldt, S.; Schartmann, F.: Stilllegung und Rückbau kerntechnischer Anlagen - Erfahrungen und Perspektiven, 4. Neu bearbeitete Auflage, Brenk Systemplanung Aachen, 2012.
- 4) Zeiher, Marco: Ein Entscheidungsunterstützungsmodell für den Rückbau massiver Betonstrukturen in kerntechnischen Anlagen, Karlsruhe, Univ., Diss., 2009.
- 5) Fortschrittsbericht über den Stand der BMBF – Stilllegungsprojekte und der vom BMBF geförderten FuE-Arbeiten zu 'Stilllegung / Rückbau kerntechnischer Anlagen'

M

5.7 Module: Seminar Construction Machinery (tmbM114) [M-BGU-105921]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Site Management and Production Methods](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	4	1

Mandatory			
T-BGU-111907	Seminar Construction Machinery	6 CR	Haghsheno

Competence Certificate

- 'Teilleistung' T-BGU-111907 with examination of other type according to § 4 Par. 2 No. 3
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The students can describe the functions and the use of different machine components. Furthermore, they can identify the different components of a construction machine on a real object of study. In addition, they are able to explain and plan the usage of specific components for concrete machine functions. The students can identify different malfunctions. They can evaluate maintenance repair work activities. In specific cases they manage some maintenance activities by themselves.

The students are capable of describing how selected construction machine sensors work. Furthermore, they can choose which sensors are appropriate for scientific test setups to examine machine and process optimization.

Also, the students learned to develop solutions for construction machine specific tasks by themselves. These solutions should be in accordance with the rules of good scientific practice.

Content

The teaching content is orientated on specific construction machines. The focus in each semester will be on one or several various machines. This is the reason why the specific content can vary from semester to semester.

The following content is part of the seminar:

- function, design and areas of application for specific construction machines
- function of specific machine components (for example hydraulic systems, motors, sensors and other machine components)

Module grade calculation

grade of the module is grade of the exam

Annotation

The content of the seminar will be created together between the lecturers and the students. Beside theoretical parts there will be practical exercises on our testing field in Linkenheim-Hochstetten. Therefore, regular participation in person will be necessary.

IMPORTANT: The number of participants is limited to 10 students. Further information for the application procedure will be announced on the homepage of the institute. When necessary, the academic progress of the student is going to decide which student will be chosen to attend on the course. The latest point of the confirmation is the end of the first week in the semester.

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- seminar/field exercise: 60 h

independent study:

- preparation and follow-up seminar/field exercises: 60 h
- portfolio, incl. report and presentation (examination): 60 h

total: 180 h

Recommendation

none

Literature

König, H.: Maschinen im Baubetrieb, Grundlagen und Anwendung. Springer Vieweg, Wiesbaden, 2014.

Grote, K.-H. und Feldhusen, J.: Dubbel Taschenbuch für den Maschinenbau. Springer, Berlin/Heidelberg/New York, 2007.

M

5.8 Module: Project Management in Construction and Real Estate Industry (tmbM201) [M-BGU-100338]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Project Management and Lean Construction](#)
[Site Management and Production Methods](#)
[Real Estate and Facility Management](#)
[Digital Technologies in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	4

Mandatory			
T-BGU-100622	Project Management in Construction and Real Estate Industry	5 CR	Haghsheno
T-BGU-108011	Student Research Project 'Scheduling and Building Site Facilities'	1 CR	Schneider

Competence Certificate

- 'Teilleistung' T-BGU-108011 with not graded accomplishment according to § 4 Par. 3
 - 'Teilleistung' T-BGU-100622 with examination of other type according to § 4 Par. 2 No. 3
 details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

The students have advanced knowledge in the field of project management in the application of construction and real estate management. The focus is particularly on the phases of project preparation (project set-up) and design. They are aware of the importance of comprehensive requirements planning and can apply methods for requirements planning and evaluate concerning completeness and plausibility. In addition, the students can explain procurement and project delivery methods and select and adapt them to the existing framework conditions of a project. They can also present the essential aspects of schedule, cost, quality, and risk management and adapt them to the project framework conditions. They can also explain approaches which can be used to shape project culture.

Content

Based on the basics of project management, selected topics in the field of project management in the application of construction and real estate management are deepened in this module.

The emphasis is placed on the following fields of action and competence:

- project preparation incl. determination of requirements,
- procurement models and award processes,
- project execution models incl. project organization and contract models,
- quality, schedule, and cost management,
- risk management,
- project culture.

Module grade calculation

grade of the module is grade of the exam

Annotation

The students work as teams within the framework of a case study. The results of the case study are documented in form of a report and presented by the students at the end of the module. The module follows the 'flipped classroom' approach.

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture/exercise: 30 h

independent study:

- preparation and follow-up lecture/exercises: 60 h
- teamwork, preparation of the paper and presentations (examination): 60 h
- preparation of student research project (not graded accomplishment): 30 h

total: 180 h

Recommendation

course 'Project Management' (6200106)

Literature

- Ahrens, H.; Bastian, K.; Muchowski, L. (Hrsg.) (2021): Handbuch – Projektsteuerung, Baumanagement. Fraunhofer IRB Verlag.
- Allison, M.; Ashcraft, H.; Cheng, R.; Klawens, S.; Pease, J. (2018): Integrated Project Delivery - An Action Guide for Leaders.
- Ausschuss der Verbände und Kammern der Ingenieure und Architekten für die Honorarordnung e.V. (Hrsg.) (2020): Heft Nr. 9: Projektmanagement in der Bau- und Immobilienwirtschaft - Standards für Leistungen und Vergütung. Reguvis Fachmedien.
- Breyer, W. (2017): Partnering Modelle - ein internationaler Vergleich. In: Planen, Errichten und Betreiben. Digitalisierung im Bau. 4. Internationaler BBB-Kongress. Hrsg. von Fritz Berner. BBB Professoren. Stuttgart: Institut für Baubetriebslehre, Universität Stuttgart, S. 163–177.
- Eitelhuber, A. et al. (Hrsg.) (2008). Partnering in der Bau- und Immobili- enwirtschaft: Projektmanagement- und Vertragsstandards in Deutschland. Handbücher: Rechtswissenschaften und Verwaltung. Kohlhammer, Stuttgart. ISBN: 9783170198616.
- Eschenbruch, K. (2009). Projektmanagement und Projektsteuerung für die Immobilien- und Bauwirtschaft. Die rechtlichen Grundlagen für Leistung, Vergütung, Nachträge, Haftung, Vergabe und Vertragsgestaltung – Kom- mentar zum Vertragsmusterrecht und Leistungsbild Bund – mit Vertrags- mustern aus der Praxis für öffentliche und private Auftraggeber. 3. Aufl., Werner, Neuwied. ISBN: 978-3-8041-1467-8.
- Fiedler, M. (2018): Lean Construction – Das Managementhandbuch – Agile Methoden und Lean Management im Bauwesen. Springer, Berlin, Heidelberg.
- Girmscheid, G. (2016): Projektabwicklung in der Bauwirtschaft: Wege zur Win-Win-Situation für Auftraggeber und Auftragnehmer. Wege zur Win-Win-Situation für Auftraggeber und Auftragnehmer. 5. Aufl. VDI-Buch. Springer, Berlin, Heidelberg. ISBN: 978-3-662-49329-8.
- Heidemann, A. (2011): Kooperative Projektabwicklung im Bauwesen unter der Berücksichtigung von Lean-Prinzipien - Entwicklung eines Lean- Projektabwicklungssystems. Internationale Untersuchungen im Hinblick auf die Umsetzung und Anwendbarkeit in Deutschland". Karlsruhe: Universität Karlsruhe. ISBN: 978-3-86644-583-3.
- Kochendörfer, B.; Liebchen, J. H.; Viering, M. G. (2018): Bau-Projekt-Management. Grundlagen und Vorgehensweisen. 5. Aufl. Leitfaden des Baubetriebs und der Bauwirtschaft. Wiesbaden, Springer Vieweg. ISBN: 978-3-8348-1823-2. DOI: 10.1007/978-3-8348-2245-1. URL: <http://dx.doi.org/10.1007/978-3-8348-2245-1>.
- Mafakheri, F.; Dai, L.; Slezak, D.; Nasiri, F. (2007): Project Delivery System Selection under Uncertainty. In: Journal of Management in Engineering 23 (4), S. 200-206.
- Schlabach, C. (2013): Untersuchungen zum Transfer der australischen Projektabwicklungsform Project Alliancing auf den deutschen Hochbaumarkt. Dissertation, Kassel, Universität Kassel. ISBN: 9783862194902.
- Sommer, H. (2016): Projektmanagement im Hochbau mit BIM und Lean Management. Springer Vieweg.
- Walker, D. H. T.; Rowlinson, S. (Hrsg) (2020): Routledge handbook of integrated project delivery. 1. Aufl. Routledge handbooks. London, Routledge. ISBN: 9781138736689.
- Zuber, S. Z. S.; Nawi, M. N. M.; Nifa, F. A. A.; Bahaudin, A. Y. (2018): An Overview of Project Delivery Methods in Construction Industry. In: International Journal of Supply Chain Management 7 (6), S. 177-182.

M

5.9 Module: Lean Construction (tmbM202) [M-BGU-100104]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Project Management and Lean Construction](#)
[Site Management and Production Methods](#)
[Digital Technologies in Construction](#)
[People and Environment in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	3

Mandatory			
T-BGU-101007	Project Paper Lean Construction	1,5 CR	Haghsheno
T-BGU-108000	Lean Construction	4,5 CR	Haghsheno

Competence Certificate

- 'Teilleistung' T-BGU-101007 with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-BGU-108000 with written examination according to § 4 Par. 2 No. 1

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

The students are able to explain the theoretical basics of Lean Construction. They are able to choose the right process management approach for a project and to adapt and improve it during the project. Furthermore, students will be able to identify and analyze problems in construction projects from a process perspective. The students are able to explain the different tools of Lean Construction and select, combine and apply them according to the problem.

Content

In this module, the theoretical basics of Lean Construction are presented at the beginning and deepened through learning simulations and exercises. Subsequently, the Last Planner System™, value stream mapping and cooperative contract forms, among others, are examined in depth. Aspects such as construction site logistics, cost and quality management and planning management from a lean perspective. In the exercise, students work in small groups on selected topics based on provided literature and analyze them in the context of the knowledge from the lecture. The results of the small group work are compiled in a written paper and presented at the end of the lecture. To consolidate and reflect on the learning objective, a joint follow-up of the small group work will take place, in which the individual works will be placed in an overall context.

Module grade calculation

grade of the module is CP weighted average of grades of the partial exams

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture, exercise: 60 h

independent study:

- preparation and follow-up lectures, exercises: 30 h
- preparation of project with report (partial exam): 30 h
- examination preparation (partial exam): 60 h

total: 180 h

Recommendation

none

Literature

Gehbauer, F. (2013) *Lean Management Im Bauwesen*. Skript des Instituts für Technologie und Management im Baubetrieb, Karlsruher Institut für Technologie (KIT).

Liker, J. & Meier, D. (2007) *Praxisbuch, der Toyota Weg: für jedes Unternehmen*. Finanzbuch Verlag.

Rother, M., Shook, J., & Wiegand, B. (2006). *Sehen lernen: mit Wertstromdesign die Wertschöpfung erhöhen und Verschwendung beseitigen*. Lean Management Institut.

M

5.10 Module: Lean Integrated Project Delivery (Lean IPD) (tmbM203) [M-BGU-105925]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Project Management and Lean Construction](#)
[Site Management and Production Methods](#)
[Real Estate and Facility Management](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	4	1

Mandatory			
T-BGU-111911	Project Lean Integrated Project Delivery	3 CR	Haghsheno
T-BGU-111910	Lean Integrated Project Delivery	3 CR	Haghsheno

Competence Certificate

- 'Teilleistung' T-BGU-111911 with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-BGU-111910 with written examination according to § 4 Par. 2 No. 1

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

Students will be able to describe the basic approaches of Integrated Project Delivery (IPD) and its international models (IPD, Alliancing, Project Partnering) and to explain the associated functionalities and elements (values, culture, organization, economics, methods, and legal characteristics of a multi-party contract). In particular, they are able to analyze the interrelationships between IPD and lean management approaches and to present them from different perspectives. In addition, students will be able to apply appropriate Lean methods using practical examples for the development, planning and execution phases of construction projects, which are essential for the success of IPD projects (including Conditions of Satisfaction, Target Value Design, Set based Design, Choosing by Advantages).

Content

The following content will be covered in this module:

- challenges of traditional project delivery models in the construction industry
- basics of Integrated Project Delivery as an innovative approach, incl. the development in the international context
- development of IPD in Germany
- characteristics and model elements of IPD
- phase model of Integrated Project Delivery
- specifics of multi-party contracts and the selection process of project partners
- IPD from the perspective of lean management philosophy
- selected Lean methods with special relevance for IPD projects (Conditions of Satisfaction, Target Value Design, Set based Design, Choosing by Advantages)

In the context of a case study, the contents of an IPD project are worked on by teams. The results of the case study are documented in the form of a report and presented by the students at the end of the module.

Module grade calculation

grade of the module is CP weighted average of grades of the partial exams

Annotation

The module set-up follows the 'flipped classroom' approach. This means that after a short common introduction the case study is to be prepared by team work. At selected dates events (meetings, interim presentations etc.) in the plenum are arranged.

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture/exercise: 45 h

independent study:

- preparation and follow-up lecture/exercises: 45 h
- case study as team work, preparation of report and presentation (partial examination): 45 h
- examination preparation (partial examination): 45 h

total: 180 h

Recommendation

module Lean Construction [tmbM202]

Literature

AIA California Council (2014): Integrated Project Delivery: an Updated. American Institute of Architects.

Allison, M.; Ashcraft, H.; Cheng, R.; Klawens, S.; Pease, J. (2018): Integrated Project Delivery - An Action Guide for Leaders.

Ashcraft, H. (2011): IPD Teams: Creation, Organization and Management.

Breyer, W. (2017): Partnering Modelle - ein internationaler Vergleich. In: Planen, Errichten und Betreiben. Digitalisierung im Bau. 4. Internationaler BBB-Kongress. Hrsg. von Fritz Berner. BBB Professoren. Stuttgart: Institut für Baubetriebslehre, Universität Stuttgart, S. 163–177.

Fiedler, M. (2018): Lean Construction – Das Managementhandbuch – Agile Methoden und Lean Management im Bauwesen. Springer, Berlin, Heidelberg.

Fischer, M.; Khanzode, A.; Reed, D.; Ashcraft, H. W. (2017): Integrated Project Delivery. John Wiley & Sons, Somerset.

Haghsheno, S.; Baier, C.; Schilling Miguel, A.; Talmon, P.; Budau, M. (2020): Integrated Project Delivery (IPD) – Ein neues Projektabwicklungsmodell für komplexe Bauvorhaben. In: Bauwirtschaft, 5 (2), 80–93

Heidemann, A. (2011): Kooperative Projektabwicklung im Bauwesen unter der Berücksichtigung von Lean-Prinzipien - Entwicklung eines Lean- Projektabwicklungssystems. Internationale Untersuchungen im Hinblick auf die Umsetzung und Anwendbarkeit in Deutschland". Karlsruhe: Universität Karlsruhe. ISBN: 978-3-86644-583-3.

Lahdenperä, P. (2012): Making sense of the multi-party contractual arrangements of project partnering, project alliancing and integrated project delivery. In: Construction Management and Economics 30, S. 57–79.

Schlabach, C. (2013): Untersuchungen zum Transfer der australischen Projektabwicklungsform Project Alliancing auf den deutschen Hochbaumarkt. Dissertation, Kassel, Universität Kassel. ISBN: 9783862194902.

Thomsen, C.; Darrington, J.; Dunne, D.; Lichtig, W. (2009): Managing Integrated Project Delivery. Construction Management Association of America.

Walker, D. H. T.; Rowlinson, S. (Hrsg) (2020): Routledge handbook of integrated project delivery. 1. Aufl. Routledge handbooks. London, Routledge. ISBN: 9781138736689.

M

5.11 Module: Research Seminar Construction Management (tmbM211) [M-BGU-103917]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Site Management and Production Methods](#)
[Project Management and Lean Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each term	2 terms	German	4	1

Mandatory			
T-BGU-108008	Research Seminar Construction Management	6 CR	Haghsheno

Competence Certificate

- 'Teilleistung' T-BGU-108008 with examination of other type according to § 4 Par. 2 No. 3
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The students can name the principles of the theory of science and different research methods and can apply them self-reliantly to scientific problems in the context of construction management. They are able to prepare self-reliantly scientific papers.

Content

- theory of science
- research methods in context of research questions in construction management
- basics for scientific working
- structure, form and style of scientific papers
- application at example of specific and current research questions in the field of construction management
- intermediate and final presentations of current research with discussion
- semester accompanying seminar paper

Module grade calculation

grade of the module is grade of the exam

Annotation

The module can be started with in the summer and in the winter semester as well. The courses of the module do not depend on each other and can be taken in arbitrary order.

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Research Seminar Construction Management I: 30 h
- Research Seminar Construction Management II: 30 h

independent study:

- preparation and follow-up Research Seminar Construction Management I: 30 h
- preparation and follow-up Research Seminar Construction Management II: 30 h
- project work, preparation of report and colloquium (exam): 60 h

total: 180 h

Recommendation

none

M

5.12 Module: Real Estate Management (tmbM301) [M-BGU-100346]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Real Estate and Facility Management](#)
 Subject-Specific Supplements

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	1

Mandatory			
T-BGU-100629	Real Estate Management	6 CR	Lennerts

Competence Certificate

- 'Teilleistung' T-BGU-100629 with written examination according to § 4 Par. 2 No. 1
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

Students can distinguish between the prevailing real estate investment alternatives and apply the common controlling instruments in real estate management. They can evaluate real estate by means of different valuation methods and to prepare expert opinions. Furthermore, they can explain the basic features and specifics of real estate management in the public sector and the management of corporate real estate. Furthermore, they have knowledge of the decision-making bases and the implementation of public-private partnership projects and can clarify the benefits and limits of this procurement alternative. Furthermore, the students gain insight into the project development of real estate based on theoretical principles and case studies from practice and are put in a position to solve problems in project development.

Content

- controlling in real estate management
- valuation of real estate with the preparation of expert opinions
- special features in the management of corporate real estate
- special features in the real estate management of the public sector
- contract models and financing structures in PPP projects
- theoretical transfer and case studies from practice in the field of project development of real estate

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Real Estate Management Controlling lecture: 15 h
- Property Valuation Basics lecture: 15 h
- Corporate and Public Real Estate Management lecture: 15 h
- Project Development with Case Study lecture: 15 h

independent study:

- preparation and follow-up lectures Real Estate Management Controlling: 15 h
- preparation and follow-up lectures Property Valuation Basics: 15 h
- preparation and follow-up lectures Corporate and Public Real Estate Management: 15 h
- preparation and follow-up lectures Project Development with Case Study: 15 h
- examination preparation: 60 h

total: 180 h

Recommendation

none

M

5.13 Module: Facility Management (tmbM302) [M-BGU-105922]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Real Estate and Facility Management](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	1

Mandatory			
T-BGU-111908	Facility Management	6 CR	Lennerts

Competence Certificate

- 'Teilleistung' T-BGU-111908 with written examination according to § 4 Par. 2 No. 1
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The students can name the term as well as the goals and tasks of FM and explain and differentiate the structures and work areas of commercial, infrastructural, and technical FM.

The students can classify and communicate risks for owners and operators of facilities and assign the operator responsibility to different actors. They can recognise, assess, and communicate potential legal consequences.

Furthermore, the students can name the basics of the concepts in maintenance management in general as well as in the areas of construction and maintenance.

The students can also apply the central standards, guidelines and laws of space management, measure and evaluate space utilisation costs and assess potentials for space optimisation in companies.

Content

- introduction to commercial, infrastructural, and technical FM
- maintenance management
- space management
- resources management
- operator responsibility
- interdisciplinary tasks in FM

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture/exercise: 60 h

independent study:

- preparation and follow-up lecture/exercises: 60 h
- examination preparation: 60 h

total: 180 h

Recommendation

none

M

5.14 Module: Sustainability in Real Estate Management (tmbM303) [M-BGU-100112]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Real Estate and Facility Management](#)
[People and Environment in Construction](#)
[Project Management and Lean Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	4	1

Mandatory			
T-BGU-100149	Sustainability in Real Estate Management	6 CR	Lennerts

Competence Certificate

- 'Teilleistung' T-BGU-100149 with written examination according to § 4 Par. 2 No. 1

details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The students can present the essential interrelationships within sustainable construction and operation and understand the importance of multi-criteria analyses. The students analyse current scientific publications in this field independently with the aim of arguing thematically and scientifically in society. They can explain the focus of international real estate sustainability certification systems, describe differences in their assessment methodology and highlight their advantages and disadvantages.

Furthermore, the students can apply selected assessment criteria of the systems presented. The students understand questions of economic and ecological assessment along the life cycle of buildings and can independently carry out life cycle analyses. They can interpret the results of life cycle analyses and to evaluate system limits and calculation parameters in published analyses.

Content

- definition and history of the term sustainability
- study of current peer-reviewed papers
- economic, ecological, and socio-cultural significance of the built environment
- costs and environmental impacts of real estate
- national and international sustainability assessment procedures for real estate
- calculation methods for life cycle costs
- life cycle assessment for buildings
- external costs in building construction and their integration in life cycle costing

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Sustainability in Real Estate Management lecture/exercise: 45 h
- Life Cycle Management of Real Estate lecture: 15 h

independent study:

- preparation and follow-up lecture/exercises Sustainability in Real Estate Management: 45 h
- preparation and follow-up lectures Life Cycle Management of Real Estate: 15 h
- examination preparation: 60 h

total: 180 h

Recommendation

courses Facility und Real Estate Management I (6200414), Life Cycle Management (6200615)

M

5.15 Module: Real Estate and Facility Management - on Site Lectures (tmbM311) [M-BGU-105924]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Real Estate and Facility Management](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	4	2

Mandatory			
T-BGU-111909	Real Estate and Facility Management - on Site Lectures	6 CR	Lennerts

Competence Certificate

- 'Teilleistung' T-BGU-111909 with examination of other type according to § 4 Par. 2 No. 3
 details about the learning control see at the 'Teilleistung'

Prerequisites

The modules Real Estate Management [tmbM301] and Facility Management [tmbM302] must be passed.

Modeled Conditions

The following conditions have to be fulfilled:

1. The module [M-BGU-100346 - Real Estate Management](#) must have been passed.
2. The module [M-BGU-105922 - Facility Management](#) must have been passed.

Competence Goal

The students can work independently on questions from real estate-related practice (research or application-oriented) using scientific methods and structure a given problem and present the results orally. They can select and apply methods and instruments appropriate to the problem in a well-founded manner. The students can work out the 'state-of-the-art' of a problem and a procedure for the solutions of the practical cases, to critically question and, if necessary, to adapt as well as to discard the previously worked out solution results accordingly and to derive new ones.

Content

- systematic evaluation, practice and application of scientific methods in the context of real estate-related practice
- specifying research objectives and conducting literature research
- drafting and elaboration of a research design
- derivation of scientifically based decisions for real estate-related practice
- written summary of the project work with colloquium

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture/exercise: 60 h

independent study:

- preparation and follow-up lecture/exercises: 40 h
- work on student project incl. report and presentation/colloquium: 80 h

total: 180 h

Recommendation

none

M

5.16 Module: Agile Project Management in Facility and Real Estate Management (tmbM313) [M-BGU-105920]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Real Estate and Facility Management](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	English	4	1

Mandatory			
T-BGU-111906	Agile Project Management in Facility and Real Estate Management	6 CR	Lennerts

Competence Certificate

- 'Teilleistung' T-BGU-111906 with examination of other type according to § 4 Par. 2 No. 3
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The students get familiar with the basics of agile PM and can name and explain the different roles and their tasks in relevant project teams. In addition, the tasks of the different roles in project teams are taught from an agile perspective as well as agile principles and the Scrum method. They can describe, compare and differentiate between different agile PM methods. Through the semester-long project work, the students can apply learned team management principles and innovative techniques such as prototyping, design thinking, etc., to a practical application in the field of real estate and facility management. Thereby, the students recognize the most important roles and processes in the context of a small and less complex project and subsequently acquire broad knowledge of agile project management and the practical application for planning and controlling projects.

Content

- agile project management: terminology and principles
- scrum method: roles, artifacts & in-class method simulation
- team dynamics: development phases & conflict management
- overview on prototyping & visualization tools & techniques
- design thinking & innovation

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture/exercise: 60 h

independent study:

- preparation and follow-up lecture/exercises: 40 h
- preparation of project Agile Project Management in Facility and Real Estate Management, incl. report and presentation (examination): 80 h

total: 180 h

Recommendation

none

M

5.17 Module: Facility Management in Hospitals (tmbM314) [M-BGU-106454]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Real Estate and Facility Management](#) (Usage from 10/1/2023)
[Subject-Specific Supplements](#) (Usage from 10/1/2023)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	1

Mandatory			
T-BGU-108004	Facility Management in Hospitals	6 CR	Lennerts

Competence Certificate

- 'Teilleistung' T-BGU-108004 with examination of other type according to § 4 Par. 2 No. 3
 details about the learning control see at the 'Teilleistung'

Prerequisites

The module must not be taken together with the module Facility Management in Hospitals and Hospital Management [tmbM312] not offered anymore.

Competence Goal

Students will be able to describe the basic features of the German health system with its Diagnosis Related Groups (DRG) system and understand the principle of hospital financing. They can explain the cost structures in a hospital and can understand these based on hospital accounting. Furthermore, the students can give an overview of broad areas of hospital management.

The students can distinguish between primary and secondary processes in a hospital. Students can carry out strategic planning for selected facility management processes (secondary processes). They understand the basic features of hospital planning with a focus on master planning, space and function programme and layout planning. Furthermore, the students independently carry out operating theatre simulations and understand the hygiene factor in this area.

Content

- introduction to the special property of hospitals,
- facility organizational structures and their working conditions,
- hospital new construction and renovation and their financing,
- facility cost structure based on a DRG (Diagnosis Related Group) system,
- facility management processes in hospitals,
- strategic planning and cost structure of selected facility management services,
- sustainable hospitals,
- master planning, space and functional program, and layout planning of hospitals,
- operating room simulation and hygiene in hospitals,
- process mining in healthcare,
- written summary of the project work with colloquium

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture/exercise: 60 h

independent study:

- preparation and follow-up lecture/exercises: 45 h
- written summary of the project work Facility management in hospitals with colloquium: 75 h

total: 180 h

Recommendation

course Facility and Real Estate Management (6200414)

M

5.18 Module: Digital Engineering and Construction (tmbM401) [M-BGU-105830]

Responsible: Jun.-Prof. Dr. Reza Maalek
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Digital Technologies in Construction](#)
[Site Management and Production Methods](#)
[Project Management and Lean Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	English	4	1

Mandatory			
T-BGU-111695	Digital Engineering and Construction	6 CR	Maalek

Competence Certificate

- 'Teilleistung' T-BGU-111604 with examination of other type according to § 4 Par. 2 No. 3
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

Students will be able to describe the main digital technologies for the engineering design process throughout the lifecycle of construction projects. They can explain the role of the practical applications of these technologies within the engineering design process of a real project. They are also able to apply some selected basic principles of these technologies in practical settings in the context of lab assignments.

Content

Recent advancements in digital and remote sensing technologies in construction engineering and management is paving the path to the conception of industry 4.0 in construction (construction 4.0). A full digitization and automation of the construction industry is projected to produce annual cost savings of around € 1.3 trillion globally compared to current practices according to the most reliable sources (e.g., World Economic forum). The full digitization and automation must start from the early design stages of the project and continue throughout the construction, facility management and operations, and dismantling phases. The advancements in digital technologies now enables large scale 3D visualization, 4D and 5D simulation, design enhancements and optimizations, which were amiss in traditional design practices. The growth in information technologies has enabled the addition of intelligence through information modeling concepts onto a single model, which can then be utilized for further engineering analysis (e.g., solar, wind, structural), design optimization, and clash detection, particularly in larger projects. With the introduction of virtual reality tools, project stakeholders can now virtually walk through the project (e.g., a building) before it is built, which can reduce the possibility of change orders due to misunderstanding of design requirements. To further enhance communication between the construction labourers and the digital design, augmented and mix reality has been showing potential. This can further mitigate the risk of incorrect construction, saving time and cost of rework due to miscommunication of expectations. Another possibility is robotics and additive manufacturing, which can further help mitigate the risk of information loss between the digital and real worlds. Finally, to ensure the built complies with the design in terms of design standards and requirements, field information, such as 3D point clouds using laser scanners or smartphones, and non-destructive testing (NDT) methods can be performed so as to determine the discrepancies early on and prevent costly rework when the degree of influence on the project becomes less. This course is designed to provide the learners with the tools necessary to understand the digital engineering and construction framework, and the cutting-edge technologies used to foster construction automation, along with the challenges, limitations and future progressions.

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture/lab assignment: 60 h

independent study:

- preparation and follow-up lecture/lab assignments: 60 h
- examination preparation: 60 h

total: 180 h

Recommendation

modules Building Information Modeling (BIM) [tmbM402], Digital Planning and Building Information Modeling [bauIM1S42-tmbM614]

course Computer Aided Design (CAD) (6200520)

M

5.19 Module: Building Information Modeling (BIM) (tmbM402) [M-BGU-103916]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Digital Technologies in Construction](#)
[Site Management and Production Methods](#)
[Project Management and Lean Construction](#)
[Real Estate and Facility Management](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	4	1

Mandatory			
T-BGU-108007	Building Information Modeling (BIM)	6 CR	Haghsheno

Competence Certificate

- 'Teilleistung' T-BGU-108007 with examination of other type according to § 4 Par. 2 No. 3 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The students can describe the BIM method and the theoretical foundations of different perspectives of building digitalisation. Furthermore, they can apply CAD in practice in the construction industry and carry out modelling steps and link the modelled components with further information themselves. The students can present the different interests of the project participants within the framework of BIM and assess the perspectives of different project participants in a construction project. Thus, they are able to work in a team on planning and construction processes with different project participants.

Content

"Building Information Modelling (BIM) is a collaborative working methodology that uses digital models of a building to consistently capture and manage the information and data relevant to its life cycle and to exchange them in transparent communication between the parties involved or to transfer them for further processing" [2]. The module deals with the historical development of the method and provides the theoretical foundations necessary for understanding and applying BIM. Further application possibilities such as linking the building model with production planning and ERP systems or in the area of virtual building simulation are demonstrated. In addition, a project is modelled throughout several process phases in the context of group work, taking into account the goals of various participants. Since the creation of a three-dimensional building model is an essential prerequisite for the application of BIM, an introduction to CAD is provided as part of this module. In addition, CAD exercises are offered for practical application.

Module grade calculation

grade of the module is grade of the exam

Annotation

For participation, it is necessary to have access to a notebook with a Windows operating system (64bit). The required software will be provided as student versions during the course.

registration procedure:

The number of participants is limited to 50 persons. Registration details will be published in advance on the institute's homepage. If necessary, a selection will be made taking into account the student's progress primarily students in Civil Engineering and Technology and Management in Construction. Confirmation of participation will be issued by the end of the first week of lectures.

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture/exercise: 60 h

independent study:

- preparation and follow-up lecture/exercises, tutorials: 60 h
- project work, preparation of report and presentation (exam): 60 h

total: 180 h

Recommendation

course Computer Aided Design (CAD) (6200520)

topic 'Cost Estimation' in the course Economics in Construction Operation (6200412) from the module Technology and Management in Construction [bauIBFP6-TMB]

course Site Planning and Handling (6241803) from the module Production Planning and Control in Construction [tmbM103]

Literature

[1] Borrmann, André; Köni, Markus; Koch, Christian; Beetz, Jakob; König, Markus (Hg.) (2015): Building information modeling // Building Information Modeling. Technologische Grundlagen und industrielle Praxis. Wiesbaden: Springer Vieweg (VDI-Buch).

[2] Bundesministerium für Verkehr und digitale Infrastruktur (Hg.) (2015): Stufenplan Digitales Planen und Bauen. Einführung moderner, IT-gestützter Prozesse und Technologien bei Planung, Bau und Betrieb von Bauwerken.

[3] Hausknecht, Kerstin; Liebich, Thomas (2016): BIM-Kompendium. Building Information Modeling als neue Planungsmethode. Stuttgart: Fraunhofer IRB Verlag.

M

5.20 Module: Digital Technologies in Field Information Modeling (tmbM403) [M-BGU-105638]

Responsible: Jun.-Prof. Dr. Reza Maalek
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Digital Technologies in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	English	4	1

Mandatory			
T-BGU-111276	Digital Technologies in Field Information Modeling	6 CR	Maalek

Competence Certificate

- 'Teilleistung' T-BGU-111276 with examination of other type according to § 4 Par. 2 No. 3
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

This course discusses the practical methods to digitally document, model, store, and share required spatial and temporal information throughout the construction project's lifecycle. Students will get familiarized with the different state-of-the-art remote sensing technologies applicable to automating the collection of field construction information. The students will be able to use technologies, such as laser scanners, to automate construction engineering and management processes, including, progress monitoring, quality control, structural integrity assessment, and safety management. Students will be provided with the practical strategies and tools necessary to analyze the acquired field information to promote the seamless transfer of information between the real and digital worlds. These technologies and methodologies will allow the students to apply the domain of field information modeling (FIM) in practical settings.

Content

Construction project information modeling frameworks, such as building information modeling (BIM), heritage building information modeling (H-BIM), or bridge information modeling (BrIM), involve modeling and integrating intelligent and semantic information within multi-dimensional (n-D) computer-aided design (CAD) models. During the design stages, the 3-dimensional (3D) digital model of a construction project can be created, whereby each element is classified based on attributes such as functional type (e.g. structural wall), elemental relationships (e.g. structural wall and floor slab connectivity and interaction), and geometric properties (e.g. shape and size). Further modeling can be carried out so as to integrate project planning and control information, such as work sequences and duration (e.g. 4D BIM), as well as cost (e.g. 5D BIM), enabling the project management team to directly evaluate the impact of design changes on the project's schedule and cost. During construction, the designed n-D model serves as a detailed baseline to aid field construction work. Relevant field data must then be collected and compared to the designed model to ensure compliance. Particularly within the lean project delivery, recording fast, frequent, and reliable field data is desired to foster continual improvement. In the context of schedule and cost control for instance, daily measurement of percent planned complete, recommended as a part of the Last Planner® system, combined with frequent earned value analysis, require up-to-date knowledge of the progress of activities. Hence, Field Information Modeling (FIM) is essential to model and transform collected field data into intelligent, tangible and semantic digital models as a means of promoting the seamless flow of information between the field and the digital worlds. This course is designed to provide the learners with the tools necessary to understand the concept of FIM, the cutting-edge technologies that can be used to foster the FIM process, and methods to fully automate the FIM process along with the challenges, limitations and future progressions.

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture/exercise: 60 h

independent study:

- preparation and follow-up lecture/exercises, tutorials: 60 h
- project work, preparation of report and presentation (examination): 60 h

total: 180 h

Recommendation

module Digital Engineering and Construction [tmbM401]

M

5.21 Module: Digitalization in Facility and Real Estate Management (tmbM404) [M-BGU-104348]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Digital Technologies in Construction](#)
[Real Estate and Facility Management](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	1

Mandatory			
T-BGU-108941	Digitalization in Facility and Real Estate Management	6 CR	Lennerts

Competence Certificate

- 'Teilleistung' T-BGU-108941 with examination of other type according to § 4 Par. 2 No. 3
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

Students will acquire basic knowledge of sensor networks, building automation and the application of the 'Internet of Things' (IoT) in facility and real estate management. They will be able to take a critical look of the technologies of digitization (including network structures, cloud storage, sensor distribution, information privacy, augmented reality) and evaluate them according to the requirements of facility and real estate management. In addition, students will be able to implement simple sensor networks and the basics of 'augmented reality' by using a HoloLens.

Content

- Basic information of concepts of digitalization
- Execute Internet of Things in building automation
- Integration of sensor signals in FM processes
- Visualize of maintenance and inspection work through 'augmented reality' (HoloLens)
- Producing project work during the semester colloquium

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Digitalization in Facility and Real Estate Management lecture/exercise: 60 h

independent study:

- preparation and follow-up lecture/exercises Digitalization in Facility and Real Estate Management: 40 h
- preparation of project Digitalization in Facility and Real Estate Management, incl. report and presentation (examination): 80 h

total: 180 h

Recommendation

none

M

5.22 Module: Environmentally-friendly Recycling and Disassembly of Buildings (tmbM501) [M-BGU-100110]

Responsible: Prof. Dr.-Ing. Sascha Gentes
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Site Management and Production Methods](#)
[People and Environment in Construction](#)
[Real Estate and Facility Management](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	4	1

Mandatory			
T-BGU-100146	Environmentally-Friendly Recycling and Disassembly of Buildings	6 CR	Gentes

Competence Certificate

- 'Teilleistung' T-BGU-100146 with oral examination according to § 4 Par. 2 No. 2

details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The students can independently plan demolition, dismantling and disposal work for structural and technical systems, apply for them and implement them on site. They recognize the need and the sense of qualified demolition and the associated recycling related to the entire construction operation. They can explain various methods and procedures for implementation and realization. The students can assess demolition objects and demolition waste according to the current legal situation, implement safety requirements for demolition work and write risk assessments. They are able to evaluate recycling and disposal options and thus independently plan the necessary resources for demolition work (personnel, machines, processes) and create corresponding calculations.

Content

Information about the state of research and technology with respect to machined disassembly, transport, conditioning, dumping, and disposal of demolition waste, as well as the latest developments in machine technology is imparted. The entire approval process from the demolition license application to machine deployment plans will be discussed in addition to technical aspects. This also involves occupational safety, immission control, as well as handling pollutants in buildings to be demolished. Specific tasks, e.g. the partial demolition of existing buildings, will be explained and calculated using existing examples. VDI (The Association of German Engineers) guidelines pertaining to demolition projects will be introduced and an excursion to a recycling facility will provide the opportunity to discuss landfill directives.

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Project Studies lecture, exercise: 30 h
- Disassembly Process Engineering lecture, exercise: 30 h

independent study:

- preparation and follow-up lectures, exercises Project Studies: 30 h
- preparation and follow-up lectures, exercises Disassembly Process Engineering: 30 h
- examination preparation: 60 h

total: 180 h

Recommendation

none

Literature

- 1) Seemann, Axel: Entwicklung integrierter Rückbau- und Recyclingkonzepte für Gebäude - ein Ansatz zur Kopplung von Demontage, Sortierung und Aufbereitung, Shaker, Aachen, 2003.
- 2) RAL, Deutsches Institut für Gütesicherung und Kennzeichnung e.V.: Ausbau und Entsorgung von Gefahrstoffen in Bauwerken - Gütesicherung, Beuth, Ausg. Juni 2004, Berlin, 2004.
- 3) Schröder, Marcel [Red.]: Abbrucharbeiten - Grundlagen, Vorbereitung, Durchführung, Müller, 3., aktualisierte und erw. Aufl., Köln, 2015.
- 4) VDI 6202 "Schadstoffsanierung"
- 5) VDI 6210 "Abbruch"

M

5.23 Module: Leadership and Communication (tmbM502) [M-BGU-105917]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Project Management and Lean Construction](#)
[People and Environment in Construction](#)
[Site Management and Production Methods](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	4	2

Mandatory			
T-BGU-111900	Leadership and Communication	6 CR	Haghsheno

Competence Certificate

- 'Teilleistung' T-BGU-111900 with written examination according to § 4 Par. 2 No. 1
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

Students are taught how to explain the basics of leadership. They are able to classify leadership in the business management functions. They will also be able to list, describe and differentiate between various organizational and legal forms of companies. In the area of strategic planning, they can recognize types of strategy in construction companies and analyze their implementation. In the context of labor law, students will be able to define the concept of employee and distinguish it from self-employment. They are aware of the essential elements of a legally compliant admonition, warning and termination and are able to draft these writings.

The students are furthermore able to describe different communication models and to apply different communication techniques. They can explain the important basics from the topic area of public participation and know the associated concepts and methods. Furthermore, they are able to describe the components of conflict management systems and know about the role of communication in the context of conflict prevention as well as conflict resolution and are sensitized to the stages of conflict escalation. They also know methods of conflict resolution and can explain the concept of mediation in particular.

Content

In the area of management, generic strategies for construction companies and their implementation in the context of organizational structures and legal forms are taught. The procedures and processes for developing a corporate strategy and its implementation are explained. Furthermore, leadership principles as well as tasks and tools in the context of leadership are taught. The fundamentals and methods of personnel management, including determining personnel requirements, development, recruitment and motivation, are dealt with and illustrated by means of an example. In addition, the basics of labor law are taught with a focus on personnel management and personnel responsibility.

In the area of communication, communication models and communication techniques are presented and their application is tested with the help of a group exercise. As an example of communication in the context of construction projects, the topic of public participation is dealt with. In addition to the theoretical basics, a practical example will be presented. Furthermore, the topic of communication in conflict situations will be discussed with the aspects of conflict prevention, escalation and resolution. Furthermore, methods of conflict resolution are presented with a focus on the concept of mediation.

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture/exercise: 60 h

independent study:

- preparation and follow-up lecture/exercises: 60 h
- examination preparation: 60 h

total: 180 h

Recommendation

keine

M

5.24 Module: Upgrading of Existing Buildings and Energetic Refurbishment (tmbM503) [M-BGU-100108]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Real Estate and Facility Management](#)
[People and Environment in Construction](#)
[Site Management and Production Methods](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	3

Mandatory			
T-BGU-100621	Term Paper Upgrading of Existing Buildings and Energetic Refurbishment	1,5 CR	Lennerts
T-BGU-108001	Upgrading of Existing Buildings and Energetic Refurbishment	4,5 CR	Lennerts

Competence Certificate

- 'Teilleistung' T-BGU-100621 with examination of pther type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-BGU-108001 with written examination according to § 4 Par. 2 No. 1

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

Students understand the economic, ecological and cultural significance of the building stock and to describe the specific tasks for a civil engineer in this field of activity. You can explain the advantages and disadvantages of different maintenance strategies and maintenance budgets can be calculated for real estate stocks. You know the basics of a technical due diligence and the basics of building information modeling. In addition, students may constitute the legal framework for energy rehabilitation measures and can use the methods of the energy performance of buildings apply.

Content

- durability and wear of components
- determination of component lifetimes
- budgeting of maintenance costs
- condition assessment & action planning
- monument and Historic Monuments
- building Information Modeling (BIM)
- policy development and historical development of the energy savings
- forms of energy and calculation of energy use
- energy efficiency of buildings by Energy Saving Ordinance
- renewables

Module grade calculation

grade of the module is CP weighted average of grades of the partial exams

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Upgrading of Existing Buildings lecture, exercise: 45 h
- Energetic Refurbishment lecture: 15 h

independent study:

- preparation and follow-up lectures/exercises Upgrading of Existing Buildings: 30 h
- preparation and follow-up lectures Energetic Refurbishment: 15 h
- preparation of term paper (partial examination): 25 h
- examination preparation (partial examination): 50 h

total: 180 h

Recommendation

none

M

5.25 Module: Building Preservation of Concrete and Masonry Constructions (tmbM611) [M-BGU-100058]

Responsible: Dr.-Ing. Michael Vogel
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Site Management and Production Methods](#)
[Real Estate and Facility Management](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	4	2

Mandatory			
T-BGU-100175	Student Research Project 'Building Preservation of Concrete and Masonry Constructions'	1 CR	Vogel
T-BGU-100038	Building Preservation of Concrete and Masonry Constructions	5 CR	Vogel

Competence Certificate

- 'Teilleistung' T-BGU-100175 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-100038 with oral examination according to § 4 Par. 2 No. 2

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

After successful completion of the module the students have detailed knowledge about the relevant causes and processes of degradation in concrete and masonry constructions. Thus they are able to take appropriate measures to enhance the durability of solid buildings and to plan and execute effective measures to repair damaged concrete and masonry constructions. Moreover the students have also the knowledge about the main aspects and basic techniques of building reinforcement.

Content

This course provides fundamental knowledge of the possibilities to preserve concrete and masonry constructions. Besides an introduction into the characteristics of masonry, plaster, concrete and reinforced concrete structures, various damage patterns and their origins are discussed. Based on the knowledge of the essential damage processes, efficient measures for the increase of the durability are described, which include material and constructional precautions as well as additional preventive measures. Furthermore the course focuses on the repair of already damaged concrete and masonry constructions. In this connection different research methods for the analysis of damages are presented and various possibilities are shown to predict the time-development of these damages. Finally repair materials as well as procedures are described which are necessary for the realization of a durable repair measure. A further main part of the course covers the different possibilities of an additional reinforcement of concrete and masonry constructions. Applicable materials and their characteristics in design and construction are introduced and discussed. In the accompanying exercises the subject matter shall independently be developed and the practical realization will be practised by means of several design problems.

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Protection, Rehabilitation and Reinforcement of Concrete and Masonry Constructions lecture, exercise: 45 h
- Building Analysis lecture: 15 h

independent study:

- preparation and follow-up lectures, exercises Protection, Rehabilitation and Reinforcement of Concrete and Masonry Constructions: 25 h
- preparation and follow-up lectures Building Analysis: 15 h
- preparation of student research project "Building Preservation of Concrete and Masonry Constructions": 40 h
- examination preparation: 40 h

total: 180 h

Recommendation

none

Literature

Hand-outs and (selection):

- [1] Blaich, J.: Bauschäden - Analyse und Vermeidung; EMPA; Stuttgart, 1999
- [2] Pfefferkorn, W.: Rißschäden an Mauerwerk, Ursachen erkennen - Rißschäden vermeiden; Stuttgart, IRB Verlag, 1994
- [3] Reichert, H.: Konstruktiver Mauerwerksbau, Bildkommentar zur DIN 1053-1, Rudolf Müller Verlag, Köln, 1999
- [4] Ruffert, G.: Ausbessern und Verstärken von Betonbauteilen; 2. Aufl.; Beton Verlag, 1982
- [5] SIVV - Handbuch: Schützen, Instandsetzen, Verbinden und Verstärken von Betonbauteilen; Verarbeiten von Kunststoffen im Betonbau beim Deutschen Beton- und Bautechnik-Verein E.V.; IRB Verlag, Stuttgart, 2008
- [6] Stark, J.; Wicht, B.: Dauerhaftigkeit von Beton - Der Baustoff als Werkstoff, Hrsg.: Bauhaus-Univ. Weimar, F.A. Finger-Institut für Baustoffkunde -FIB-; 2001
- [7] Tausky, R.: Betontragwerke mit Außenbewehrung; Birkhäuser Verlag, Basel, 1993

M

5.26 Module: Building Physics I (tmbM612) [M-BGU-103950]

Responsible: Prof. Dr.-Ing. Frank Dehn
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Real Estate and Facility Management
 Subject-Specific Supplements

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	1

Mandatory			
T-BGU-100039	Applied Building Physics	3 CR	N.N.
T-BGU-100040	Building Technology	3 CR	Wirth

Competence Certificate

- 'Teilleistung' T-BGU-100039 with oral examination according to § 4 Par. 2 No. 2
 - 'Teilleistung' T-BGU-100040 with oral examination according to § 4 Par. 2 No. 2
 details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

see German version

Content

see German version

Module grade calculation

grade of the module is CP weighted average of grades of the partial exams

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Applied Building Physics lecture: 30 h
- Building Technology lecture: 30 h

independent study:

- preparation and follow-up lectures Applied Building Physics: 30 h
- examination preparation Applied Building Physics (partial exam): 30 h
- preparation and follow-up lectures Building Technology: 30 h
- examination preparation Building Technology (partial exam): 30 h

total: 180 h

Recommendation

none

M

5.27 Module: Building Physics II (tmbM613) [M-BGU-100060]

Responsible: Prof. Dr.-Ing. Frank Dehn
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Site Management and Production Methods](#)
[Real Estate and Facility Management](#)
[People and Environment in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	4	4

Mandatory			
T-BGU-108024	Practical Noise Control	3 CR	Zander
T-BGU-100042	Practical Fire Protection	3 CR	Egelhaaf

Competence Certificate

- 'Teilleistung' T-BGU-108024 with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-BGU-100042 with oral examination according to § 4 Par. 2 No. 2

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

see German version

Content

see German version

Module grade calculation

grade of the module is CP weighted average of grades of the partial exams

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Practical Noise Control lecture: 30 h
- Practical Fire Protection lecture: 30 h

independent study:

- preparation and follow-up lectures Practical Noise Control: 30 h
- examination preparation Practical Noise Control (partial exam): 30 h
- preparation and follow-up lectures Practical Fire Protection: 30 h
- examination preparation Practical Fire Protection (partial exam): 30 h

total: 180 h

Recommendation

none

M

5.28 Module: Digital Planning and Building Information Modeling (tmbM614) [M-BGU-105135]

Responsible: Dr.-Ing. Tim Zinke
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Digital Technologies in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	1

Mandatory			
T-BGU-110382	Digital Planning and Building Information Modeling	6 CR	Zinke

Competence Certificate

- 'Teilleistung' T-BGU-110382 with examination of other type according to § 4 Par. 2 No. 3
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

see German version

Content

see German version

Module grade calculation

grade of the module is grade of the exam

Annotation

further information see German version

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture, exercise: 60 h

independent study:

- preparation and follow-up lectures/exercises, tutorials: 40 h
- project work, modeling, preparation of BIM flat pattern plan and report with presentation: 80 h

total: 180 h

Recommendation

course Computer Aided Design (CAD) (6200520)

course Steel and Composite Structures (6212801 und 6212802)

Literature

- [1] Borrmann, A.; König, M.; Koch, C.; Beetz, J. (Hrsg.) (2015): Building Information Modeling – Technologische Grundlagen und industrielle Praxis. Wiesbaden: Springer Vieweg (VDI-Buch).
 [2] Baldwin, M. (2018): Der BIM-Manager – Praktische Anleitung für das BIM-Projektmanagement. Berlin, Wien, Zürich: Beuth.
 [3] Hausknecht, Kerstin; Liebich, Thomas (2017): BIM-Kompodium: Building Information Modeling als neue Planungsmethode. Stuttgart: Fraunhofer IRB.

M

5.29 Module: Models and Methods in Traffic Engineering and Transportation Planning (tmbM615) [M-BGU-100008]

Responsible: Prof. Dr.-Ing. Peter Vortisch

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [Digital Technologies in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	1

Mandatory			
T-BGU-100012	Models and Methods in Traffic Engineering and Transportation Planning	6 CR	Vortisch

Competence Certificate

- 'Teilleistung' T-BGU-100012 with oral examination according to § 4 Par. 2 No. 2
details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

see German version

Content

Methods and models in transport planning as well as the relevant tools and methods for the traffic engineer. Transport Planning:

- four-Step-Algorithm
- aggregate versus individual models
- choice modeling

Traffic Engineering:

- measuring traffic flow data
- description of traffic conditions / fundamental diagram
- capacity of roads and intersections with and without traffic signals

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Methods and Models in Transportation Planning lectures/exercises: 30 h
- Traffic Engineering lectures/exercises: 30 h

independent study:

- preparation and follow-up Methods and Models in Transportation Planning lectures/exercises: 30 h
- preparation and follow-up Traffic Engineering lectures/exercises: 30 h
- examination preparation: 60 h

total: 180 h

Recommendation

none

Literature

lecture notes with additional references / exercises

M

5.30 Module: Traffic Management und Simulation Methods (tmbM616) [M-BGU-100015]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Digital Technologies in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each term	1 term	German	4	1

Mandatory			
T-BGU-100008	Traffic Management und Simulation Methods	6 CR	Vortisch

Competence Certificate

- 'Teilleistung' T-BGU-100008 with oral examination according to § 4 Par. 2 No. 2
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

Acquisition of the specific and advanced knowledge and the relevant methodologies in the field of traffic engineering. Basic considerations in the development and the application of simulation models in transport planning and traffic engineering.

Content

In excess of the basic module "Model approaches and methods in transportation" more advanced methods of traffic engineering will be dealt with (advanced signalisation, control of routes and networks). Furthermore methods for the development of simulation models as well as their application will be in the focus (application of professional software tools for transport planning and traffic engineering). Another issue are transport telematics and intelligent transportation system.

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Traffic Management and Transport Telematics lectures/exercises: 30 h
- Traffic Flow Simulation lectures/exercises: 30 h

independent study:

- preparation and follow-up Traffic Management and Transport Telematics lectures/exercises: 30 h
- preparation and follow-up Traffic Flow Simulation lectures/exercises: 30 h
- examination preparation: 60 h

total: 180 h

Recommendation

none

Literature

lecture notes

guidelines ('Handbuch zur Bemessung von Straßen', 'Richtlinien für Lichtsignalanlagen'),

software documentations

M

5.31 Module: 2D/3D Image Analysis and Image Based Tracking Methods (tmbM617) [M-BGU-100674]

Responsible: Prof. Dr.-Ing. Stefan Hinz
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Digital Technologies in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	2

Mandatory			
T-BGU-101166	Basics in Computer Vision (2D/3D)	3 CR	Hinz
T-BGU-101167	Image Sequence Analysis	3 CR	Hinz

Competence Certificate

- 'Teilleistung' T-BGU-101166 with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-BGU-101167 with oral examination according to § 4 Par. 2 No. 2

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Module grade calculation

grade of module is defined by weighted average according credit points of grades of the partial examinations

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- 2D Computer Vision lectures: 15 h
- 3D Computer Vision lectures: 30 h
- Image Sequence Analysis lectures: 30 h

independent study:

- preparation and follow-up 2D Computer Vision lectures: 15 h
- preparation and follow-up 3D Computer Vision lectures: 15 h
- examination preparation Basics in Computer Vision: 15 h
- preparation and follow-up Image Sequence Analysis lectures: 30 h
- examination preparation Image Sequence Analysis: 30 h

total: 180 h

Recommendation

none

M**5.32 Module: Introduction to GIS for Students of Natural, Engineering and Geo Sciences (tmbM618) [M-BGU-101846]**

Responsible: Dr.-Ing. Sven Wursthorn
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [Digital Technologies in Construction](#)
[People and Environment in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	4

Mandatory			
T-BGU-103541	Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite <i>This item will not influence the grade calculation of this parent.</i>	3 CR	Wursthorn
T-BGU-101681	Introduction to GIS for Students of Natural, Engineering and Geo Sciences	3 CR	Wursthorn

Competence Certificate

- 'Teilleistung' T-BGU-103541 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite
 - 'Teilleistung' T-BGU-101681 with written examination according to § 4 Par. 2 No. 1
- details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Module grade calculation

grade of the module is grade of the exam

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture, exercise: 60 h

independent study:

- preparation and follow-up lectures, exercises: 60 h
- preparation online test (examination prerequisite): 15 h
- examination preparation: 45 h

total: 180 h

Recommendation

none

M

5.33 Module: Environmental Law (tmbM619) [M-BGU-106042]

Responsible: Dr. Ulrich Smeddinck
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [People and Environment in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
3	Grade to a tenth	Each winter term	1 term	German	4	1

Mandatory			
T-BGU-111102	Environmental Law	3 CR	Smeddinck

Competence Certificate

- 'Teilleistung' T-BGU-111102 with written examination according to § 4 Par. 2 No. 1
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Module grade calculation

grade of the module is grade of the exam

Annotation

None

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture: 30 h

independent study:

- preparation and follow-up lectures: 45 h
- examination preparation: 15 h

total: 90 h

Recommendation

none

M

5.34 Module: Environmental Communication (tmbM620) [M-BGU-101108]

Responsible: Dr. rer. nat. Charlotte Kämpf
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [People and Environment in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	1

Mandatory			
T-BGU-106620	Examination Prerequisite Environmental Communication	0 CR	Kämpf
T-BGU-101676	Environmental Communication	6 CR	Kämpf

Competence Certificate

- 'Teilleistung' T-BGU-106620 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite
- 'Teilleistung' T-BGU-101676 with examination of other type according to § 4 Par. 2 No. 3

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

(see German version)

Content

(see German version)

Module grade calculation

grade of the module is grade of the exam

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- seminar (lecture): 20 h

independent study:

- preparation and follow-up seminar: 40 h
- preparation of literature annotations and short presentation (exam prerequisite): 45 Std.
- preparation of presentation, manuscript and poster (exam): 75 Std.

total: 180 h

Recommendation

none

Literature

(see German version)

M

5.35 Module: Urban Renewal (tmbM621) [M-BGU-100013]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [People and Environment in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	4	2

Mandatory			
T-BGU-108441	History of Urban Planning	3 CR	Hitzeroth
T-BGU-108442	Urban Management	3 CR	Karmann-Woessner

Competence Certificate

- 'Teilleistung' T-BGU-108441 with oral written according to § 4 Par. 2 No. 1
- 'Teilleistung' T-BGU-108442 with oral examination according to § 4 Par. 2 No. 2

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

The aim is to convey the principles and methods of urban renewal. In the module adaptation strategies are taught, by which cities and city regions react to changing conditions. These changes -such as climate change, demographics or changing economic practices- are encountered by urban concepts city-wide, on the level of city quarters or on the building level. In addition to the urban redevelopment in Germany selected references from Europe are examined.

Content

Based on the core module "Urban and Regional Planning" this lecture is focused on adaptation strategies of cities and urban regions. In addition to a classification in the current discussions on urban redevelopment basic methods and tools are taught. The students of the module Urban Renewal shall be able to elaborate strategies of urban renewal and redevelopment. The basic methodological framework is the discussion of projects as examples for good practice. The module will be supplemented by courses such as "History of Urban Planning and the Built Environment" to consider the historical development and cultural heritage. In addition, in the course "Building Theory" urban qualities and implementation on the building level are taught.

Module grade calculation

grade of the module is CP weighted average of grades of the partial exams

Annotation**Please note:**

The course Urban Management (6231801), 2 HpW/SWS, will exceptionally not be offered in the summer semester 2024 but in the winter semester 2024/25.

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Urban Management lectures/exercises: 30 h
- Urban Planning I: History of Urban Planning and the Built Environment lectures: 30 h

independent study:

- preparation and follow-up Urban Management lectures/exercises: 30 h
- examination preparation Urban Management: 30 h
- preparation and follow-up Urban Planning I: History of Urban Planning and the Built Environment lectures: 30 h
- examination preparation History of Urban Planning: 30 h

total: 180 h

Recommendation

none

Literature

list of literature to module

M

5.36 Module: Environmental Geotechnics (tmbM622) [M-BGU-100079]

Responsible: Dr.-Ing. Andreas Bieberstein
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [People and Environment in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	4	1

Mandatory			
T-BGU-100084	Landfills	3 CR	Bieberstein
T-BGU-100089	Brownfield Sites - Investigation, Evaluation, Rehabilitation	3 CR	Bieberstein

Competence Certificate

- 'Teilleistung' T-BGU-100084 with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-BGU-100089 with oral examination according to § 4 Par. 2 No. 2

details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The students can describe the legal guidelines regarding the disposal of wastes and the permitted threshold value for brownfields. They can outline the geotechnical concerns in the construction of landfill sites depending on the particular landfill classification, landfill elements, their relevant requirements and necessary certifications. They are able to interlink interdisciplinarily the chemical, mineralogical, biological, hydraulic and geotechnical aspects dealing with brownfields. They can choose reasonably between the relevant remediation technologies and assess their limits of applications and risks.

Content

The module covers geotechnical techniques in dealing with waste and brownfields. The environmental engineering, scientific and legal basics are discussed. Working steps of project planning, building materials, ways of construction and proofs are presented. Techniques for burning and immobilisation are explained as well as different microbiological, electrokinetic, hydraulic and pneumatic soil remediation methods.

Module grade calculation

grade of the module is CP weighted average of grades of the partial exams

Annotation

none

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Landfills lecture/exercise: 30 h
- Brownfield Sites - Investigation, Evaluation, Rehabilitation lecture: 30 h
- Excursion: 10 h

independent study:

- preparation and follow-up lecture/exercises Landfills: 25 h
- examination preparation Landfills (partial exam): 30 h
- preparation and follow-up lectures Brownfield Sites - Investigation, Evaluation, Rehabilitation: 25 h
- examination preparation Brownfield Sites - Investigation, Evaluation, Rehabilitation (partial exam): 30 h

total: 180 h

Recommendation

none

Literature

DGGT, GDA-Empfehlungen – Geotechnik der Deponien und Altlasten, Ernst und Sohn, Berlin
 Drescher (1997), Deponiebau, Ernst und Sohn, Berlin
 Reiersloh, D und Reinhard, M. (2010): Altlastenratgeber für die Praxis, Vulkan-V. Essen

M

5.37 Module: Energy and Indoor Climate Concepts (tmbM711) [M-ARCH-103663]

Responsible: Prof. Andreas Wagner
Organisation: KIT Department of Architecture
Part of: Real Estate and Facility Management
 People and Environment in Construction
 Subject-Specific Supplements

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	Grade to a tenth	Each summer term	1 term	German	4	2

Mandatory			
T-ARCH-107406	Energy and Indoor Climate Concepts	4 CR	Wagner

Competence Certificate

Completed coursework consisting of working on a project (building analysis) and an oral exam (30 minutes).

Prerequisites

None

Competence Goal

The students:

- know the various different concepts and technologies of energy-efficient building as well as their parameters and they understand the influence these have on the performance of a building. From this they can deduce questions and investigation objectives for the optimization of an architectural design from the viewpoint of a constructive-physical and building-technical analysis.
- develop an examination strategy for answering their questions and the goals they have defined with regard to the energetic analysis of a building.
- undertake independent examinations regarding the set down construction-physical or building-technical enquiries and document their results.
- are able to independently evaluate their examination results and to communicate these. For this they utilize the commonly used tools from planning and consultation praxis.
- can argumentatively defend their way of approaching the issue as well as the solutions they have come up with whilst also being able to categorize these within the context of sustainable building.

Content

In this module the students are made familiar with the concepts and technologies of energy-efficient building. In the lecture the topics that are dealt with are constructional heat insulation, passive usage of solar energy as well as ventilation technology and systems. With a focus on non-residential buildings, concepts and technologies relating to passive cooling systems and (daylight) illumination are also dealt with. New ways regarding regenerative heat and power supply facilitation show the way forward in the direction of climate-neutral energy concepts. In addition to teaching the general principles, planning aspects are also discussed in-depth. Based on practical examples, energy and indoor climate concepts for various different building usages are looked at in more detail and are analyzed with regard to the presented parameters and evaluation criteria as well as architectural points of view. An excursion supplements this course offer. During the project work phase concrete buildings are examined regarding their energetic quality based on measurements taken and calculations made.

Module grade calculation

Module grade is the grade of the completed coursework.

Workload

Attendance time: Seminar 45 h

Self-study: preparation / follow-up, homework / project work 75 h

M

5.38 Module: Quarter Analysis (tmbM712) [M-ARCH-103633]

Responsible: Prof. Markus Neppi
Organisation: KIT Department of Architecture
Part of: Real Estate and Facility Management
 People and Environment in Construction
 Subject-Specific Supplements

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	Grade to a tenth	Each winter term	1 term	German/English	4	1

Mandatory			
T-ARCH-107375	Quarter Analysis	4 CR	Neppl

Competence Certificate

Other examination requirements consisting of an oral presentation of the work results (duration approx. 15 minutes).

Prerequisites

None

Competence Goal

The students:

- are capable of organizing their work processes in a timely and content-related manner and are able to present the work results in an appropriate manner within the team.
- can, using a variety of methods, analyze, structure and formally describe problems within the field of urban design. They are especially capable of recognizing and interpreting urban-sociological relationships and to be able to use these for their own work.
- are able to apply various different methods of analysis that they learned during their studies. In addition, they are able to apply new methods such as active citizen participation and other user-centered survey methods coming from the field of urban sociology.
- can develop integrative solutions for problems.
- are able to express their analysis results in an oral, written and drawn format and are able to place these within an urban-sociological context.

Content

Within the module large-scale urban spaces are examined as to their usage, structure and social-spatial interaction. At the same time the term of the urban quarter or district is to be defined and is analyzed as to its relevance within urban planning and development. The basics of urban sociology and contents pertaining to this are taught. One focus hereby is on the interlinking of urban-sociological contents and user-centered analysis methods such as citizen surveys and methods of participation.

Module grade calculation

The module grade is the grade of the other examination requirements.

Workload

In-class time: Seminar 30 h

Self-study: Preparation/follow-up, written paper/project 90 h

M

5.39 Module: Urban Typologies (tmbM713) [M-ARCH-103632]

Responsible: Prof. Markus Nepl
Organisation: KIT Department of Architecture
Part of: Real Estate and Facility Management
 People and Environment in Construction
 Subject-Specific Supplements

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	Grade to a tenth	Each summer term	1 term	German/English	4	1

Mandatory			
T-ARCH-107374	Urban Typologies	4 CR	Neppl

Competence Certificate

Other examination requirements consisting of an oral presentation of the work results (duration approx. 15 minutes).

Prerequisites

None

Competence Goal

The students:

- are capable of organizing their work processes in a timely and content-related manner and are able to present the work results in an appropriate manner within the team.
- are able to analyze various different building development and usage structures as well as different typologies coming from a historical or modern context.
- are able to produce their own individual layouts and floor plans for both residential and office buildings.
- are able to present the analysis results in an oral, written and drawing format.

Content

Analysis and systematization of various different building development and usage structures. Analysis of examples of different typologies from a historical and a modern context. In-depth look at the usage foci residential living. Basics of the layouts and floor plans of both residential and office buildings. Teaching development systems for different typologies. Working out an example of a hybrid residential and office building.

Module grade calculation

The module grade is the grade of the other examination requirements.

Workload

In-class time: Seminar 45 h

Self-study: Preparation/follow-up, written paper/project 75 h

M

5.40 Module: Entrepreneurship (EnTechnon) (tmbM811) [M-WIWI-106035]

Responsible: Prof. Dr. Orestis Terzidis
Organisation: KIT Department of Economics and Management
Part of: [Project Management and Lean Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each term	1 term	German/English	4	1

Mandatory			
T-WIWI-102864	Entrepreneurship	3 CR	Terzidis
T-WIWI-102866	Design Thinking	3 CR	Terzidis

Competence Certificate

- 'Teilleistung' T-WIWI-102749 with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-WIWI-102749 with examination of other type according to § 4 Par. 2 No. 3

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

Students are familiar with the basics and contents of entrepreneurship and ideally are able to start a company during or after their studies. The courses are therefore structured sequentially in modules, although in principle they can also be attended in parallel. In this way, the skills are taught to generate business ideas, to develop inventions into innovations, to write business plans for start-ups and to successfully establish a company. In the lecture, the basics of entrepreneurship will be developed, in the seminar, individual contents will be deepened. The overall learning objective is to enable students to develop and implement business ideas.

Content

The lecture form the basis of the module and give an overview of the overall topic. The seminar deepens the phases of the foundation processes, in particular the identification of opportunities, the development of a value proposition (especially based on inventions and technical innovations), the design of a business model, business planning, the management of a start-up, the implementation of a vision as well as the acquisition on resources and the handling of risks. The lecture Entrepreneurship provides an overarching and connecting framework for this.

Module grade calculation

grade of the module is CP weighted average of grades of the partial exams

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Entrepreneurship lecture: 30 h
- Design Thinking seminar: 30 h

independent study:

- preparation and follow-up lectures Entrepreneurship: 30 h
- examination preparation Entrepreneurship (partial examination): 30 h
- preparation of seminar presentation and report Design Thinking (partial examination): 60 h

total: 180 h

Recommendation

none

M

5.41 Module: Industrial Production I (tmbM812) [M-WIWI-101437]

Responsible: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Economics and Management
Part of: [Project Management and Lean Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German/English	4	4

Mandatory			
T-WIWI-102606	Fundamentals of Production Management	5,5 CR	Schultmann
Supplementary Courses (Election: 3,5 credits)			
T-WIWI-102870	Logistics and Supply Chain Management	3,5 CR	Schultmann
T-WIWI-102820	Production Economics and Sustainability	3,5 CR	Schultmann, Volk

Competence Certificate

- 'Teilleistung' T-WIWI-102606 (compulsory) with written examination according to § 4 Par. 2 No. 1 according to the selected course:

- 'Teilleistung' T-WIWI-102870 (compulsory elective) with written examination according to § 4 Par. 2 No. 1
 - 'Teilleistung' T-WIWI-102820 (compulsory elective) with written examination according to § 4 Par. 2 No. 1

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

- Students shall be aware of the important role of industrial production and logistics for production management.
- Students shall use relevant concepts of production management and logistics in an adequate manner.
- Students shall be able to reflect on decision principles in firms and their circumstances in the light of the production management aspects studied.
- Students shall be proficient in describing essential tasks, difficulties and solutions to problems in production management and logistics
- Students shall be able to describe relevant approaches of modeling production and logistic systems.
- Students shall be aware of the important role of material and energy-flows in production systems.
- Students shall be proficient in using exemplary methods for solving selected problems.

Content

This module is designed to introduce students into the wide area of industrial production and logistics management. It focuses on strategic production management under the aspect of sustainability. The courses use interdisciplinary approaches of systems, also theory to describe the central tasks of industrial production management and logistics. Herein, attention is drawn upon strategic corporate planning, research and development as well as site selection. Students will obtain knowledge in solving internal and external transport and storage problems with respect to supply chain management and disposal logistics.

Module grade calculation

grade of the module is CP weighted average of grades of the compulsory exam and the selected partial exam

Workload

contact hours (1 HpW = 1 h x 15 weeks), according to the selected course:

- Fundamentals of Production Management lecture, exercise (compulsory): 60 h
- Logistics and Supply Chain Management lecture, exercise (compulsory elective): 45 h
- Production Economics and Sustainability lecture (compulsory elective): 30 h

independent study, according to the selected course:

- preparation and follow-up lectures, exercises Fundamentals of Production Management: 45 h
- examination preparation Fundamentals of Production Management (partial examination, compulsory): 60 h
- preparation and follow-up lectures, exercises Logistics and Supply Chain Management: 15 h
- examination preparation Logistics and Supply Chain Management (partial examination, compulsory elective): 45 h
- preparation and follow-up lectures Production Economics and Sustainability: 30 h
- examination preparation Production Economics and Sustainability (partial examination, compulsory elective): 45 h

total: 270 h

Recommendation

none

M

5.42 Module: Digital Service Systems (tmbM813) [M-WIWI-106046]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: [Digital Technologies in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	4	1

Election notes

Two courses totaling 9 credit points must be selected.

Compulsory Elective Courses (Election: at most 2 items)			
T-WIWI-102884	Operations Research in Health Care Management	4,5 CR	Nickel
T-WIWI-102715	Operations Research in Supply Chain Management	4,5 CR	Nickel
T-WIWI-102641	Service Innovation	4,5 CR	Satzger

Competence Certificate

according to the selected course:

- 'Teilleistung' T-WIWI-102884 (compulsory elective) with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-WIWI-102715 (compulsory elective) with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-WIWI-102641 (compulsory elective) with written examination according to § 4 Par. 2 No. 1

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

The student

- Understands the differences between innovation and invention, and that disruptive change can have rapid and far-reaching effects on a market,
- knows examples of innovation in process, organization and business models and understands how service and product innovation differ,
- understands the link between risk and innovation, knows hurdles to innovation and how to overcome them,
- Knows and uses basic and advanced modeling techniques required for appropriate solution procedures in current supply chain management problems,
- Models problems using a mathematical approach to technical and economic issues, and derives optimal solutions,
- conceptualizes problems and classifies them mathematically by identifying essential variables and parameters in specific applications,
- Evaluates current developments in operations research in supply chain management.
- Is knowledgeable of basic and advanced operations research techniques in the healthcare field,
- possesses the ability to apply quantitative models in scheduling and internal logistics (scheduling, transportation, OR and duty scheduling, as well as inventory and layout planning) in the hospital environment,
- explains possible applications of simulation models in the health care sector as well as methods for planning ambulatory care services,
- uses the learned methods in detail on the basis of case studies in a practice-oriented manner

Content

The module focuses on teaching both theoretical principles and solution procedures for optimization problems in the service context, with an emphasis on supply chain management and health care.

Module grade calculation

grade of the module is CP weighted average of grades of the selected partial exams

Workload

contact hours (1 HpW = 1 h x 15 weeks), according to the selected course:

- Operations Research in Health Care Management lecture, exercise (compulsory elective): 45 h
- Operations Research in Supply Chain Management lecture, exercise (compulsory elective): 45 h
- Service Innovation lecture (compulsory elective): 30 h

independent study, according to the selected course:

- preparation and follow-up lectures, exercises Operations Research in Health Care Management: 45 h
- examination preparation Operations Research in Health Care Management (partial examination, compulsory elective): 45 h
- preparation and follow-up lectures, exercises Operations Research in Supply Chain Management: 45 h
- examination preparation Operations Research in Supply Chain Management (partial examination, compulsory elective): 45 h
- preparation and follow-up lectures Service Innovation: 45 h
- examination preparation Service Innovation (partial examination, compulsory elective): 60 h

total: 270 h

Recommendation

none

M**5.43 Module: Environmental Emissions and Life Cycle Assessment (tmbM814) [M-WIWI-106036]**

Responsible: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Economics and Management
Part of: [People and Environment in Construction](#)
[Subject-Specific Supplements](#)

Credits 7	Grading scale Grade to a tenth	Recurrence Each winter term	Duration 1 term	Language German/English	Level 4	Version 2
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Mandatory			
T-WIWI-102634	Emissions into the Environment	3,5 CR	Karl
T-WIWI-113107	Life Cycle Assessment – Basics and Application Possibilities in an Industrial Context	3,5 CR	Schultmann

Competence Certificate

- 'Teilleistung' T-WIWI-102634 with written examination according to § 4 Par. 2 No. 1
 - 'Teilleistung' T-WIWI-112155 with written examination according to § 4 Par. 2 No. 1
- details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

- The student can name problems from the field of technical environmental protection.
- The student knows solution approaches for the named problems and can apply them.
- The student will learn the basics and methodology of the system-analytical instrument Life Cycle Assessment.
- Ability to apply Life Cycle Assessment in practical decision-making contexts, in particular in the economy

Content**emissions into the environment:**

Emission sources/emission capture/emission reduction: an overview is given of relevant emissions of air pollutants and greenhouse gases, their capture and reduction, and the relevant legal regulations at national and international level. Basics of circular economy and recycling are also explained.

Outline:

Air Pollution Control

- Introduction, terms and definitions
- Sources and pollutants
- Legal framework of immission control
- Technical measures for emission reduction

Circular economy and recycling

- Introduction, legal basics
- Dual systems, disposal logistics
- Recycling, landfilling
- Thermal and biological waste treatment

Life Cycle Assessment and Forecasts of Global Development:

This lecture focuses on the analysis of the environmental impact of products by means of Life Cycle Assessment (LCA). Structure and steps are taught in detail and selected further developments are shown. In order to classify potential environmental impacts in a global context, forecasts of global development using integrated assessment models and system dynamics are also addressed.

Topics include:

- Attributional LCA
- Life Cycle Sustainability Assessment, Social LCA and Life Cycle Costing
- Consequential LCA
- Dynamic LCA
- System Dynamics
- Integrated Assessment Models in the Context of Climate Change

Module grade calculation

grade of the module is CP weighted average of grades of the partial exams

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Emissions into the Environment lecture: 30 h
- Life Cycle Assessment and Global Forecasts lecture: 30 h

independent study:

- preparation and follow-up lectures Emissions into the Environment: 30 h
- examination preparation Emissions into the Environment (partial examination): 45 h
- preparation and follow-up lectures Life Cycle Assessment and Global Forecasts: 30 h
- examination preparation Life Cycle Assessment and Global Forecasts (partial examination): 45 h

total: 210 h

Recommendation

none

M

5.44 Module: Foundations of Informatics I (tmbM815) [M-WIWI-106032]

Responsible: Dr.-Ing. Michael Färber
Organisation: KIT Department of Economics and Management
Part of: [Digital Technologies in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each term	1 term	German	4	1

Mandatory			
T-WIWI-102749	Foundations of Informatics I	5 CR	Färber

Competence Certificate

- 'Teilleistung' T-WIWI-102749 with written examination according to § 4 Par. 2 No. 1
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The student

- knows the essential principles, methods and systems of Informatics,
- is able to use this knowledge for applications in advanced Informatic lectures and other areas appropriate to the situation to solve problems,
- is able to find strategic and creative answers in the search for solutions to well-defined, concrete and abstract problems.
- The student will be able to reinforce the learned concepts, methods and systems of Informatics in advanced Informatic lectures.

Content

In this module, the topics of modeling, logic, algorithms, sorting and search methods, complexity theory, problem specifications, and data structures are addressed. In the area of theoretical computer science, formal models for automata, languages, and algorithms are introduced. In addition, there is an introduction to technical computer science, from maximum integration to computer architecture and computer arithmetic to operating systems and programming languages as well as file organization.

Module grade calculation

grade of the module is grade of the exam

Workload

contact hours (1 HpW = 1 h x 15 weeks), according to the selected course:

- lecture, exercise: 60 h

independent study, according to the selected course:

- preparation and follow-up lectures, exercises: 45 h
- examination preparation: 45 h

total: 150 h

Recommendation

none

M

5.45 Module: Foundations of Informatics II (tmbM816) [M-WIWI-106033]

Responsible: Dr.-Ing. Gunther Schiefer
Organisation: KIT Department of Economics and Management
Part of: [Digital Technologies in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each term	1 term	German	4	1

Mandatory			
T-WIWI-102707	Foundations of Informatics II	5 CR	Lazarova-Molnar

Competence Certificate

- 'Teilleistung' T-WIWI-102707 with written examination according to § 4 Par. 2 No. 1
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

- Students should acquire broad knowledge of methods and concepts of theoretical Informatics and computer architecture.
- Based on the imparted knowledge and the acquired skills, the students should be able to select and correctly apply the appropriate methods and concepts for well-defined problems.
- The active participation of the students in the exercises should enable them to work out appropriate solutions for problems in interaction with others on the basis of the imparted basics and to acquire necessary knowledge.

Content

The module deals with formal models for automata, languages, and algorithms as well as with real-world manifestations of these models, i.e., computer architecture and organization (hardware design, computer arithmetic, architecture concepts), programming languages (different language levels from microprogramming to higher programming languages, as well as program translation and execution), operating systems and modes (structure and properties of operating systems, concrete operating system tasks, client-server systems), file organization and data management (file organization forms, primary/secondary organization).

Module grade calculation

grade of the module is grade of the exam

Workload

contact hours (1 HpW = 1 h x 15 weeks), according to the selected course:

- lecture, tutorial: 60 h

independent study, according to the selected course:

- preparation and follow-up lectures, tutorials: 45 h
- examination preparation: 45 h

total: 150 h

Recommendation

The previous attendance of the course *Foundations of Informatics I* [2511010] is recommended.
 Active participation in the exercises is strongly recommended.

M

5.46 Module: Introduction to Programming (tmbM817) [M-WIWI-101581]

Responsible: Prof. Dr.-Ing. Johann Marius Zöllner
Organisation: KIT Department of Economics and Management
Part of: [Digital Technologies in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each winter term	1 term	German	4	1

Mandatory			
T-WIWI-102735	Introduction to Programming with Java	5 CR	Zöllner

Competence Certificate

- 'Teilleistung' T-WIWI-102735 with written examination according to § 4 Par. 2 No. 1
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

see german version

Content

see german version

Module grade calculation

grade of the module is grade of the exam

Workload

contact hours (1 HpW = 1 h x 15 weeks), according to the selected course:

- lecture, tutorial, computer lab: 90 h

independent study, according to the selected course:

- preparation and follow-up lectures, tutorials: 15 h
- examination preparation: 45 h

total: 150 h

Recommendation

none

M

5.47 Module: Applied Informatics (tmbM818) [M-WIWI-106034]

Responsible: Dr.-Ing. Michael Färber
 Prof. Dr. Andreas Oberweis
 Prof. Dr. Ali Sunyaev
 Prof. Dr. Melanie Volkamer

Organisation: KIT Department of Economics and Management

Part of: [Digital Technologies in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Level	Version
9	Grade to a tenth	Each term	1 term	4	1

Mandatory			
T-WIWI-102747	Advanced Programming - Java Network Programming	4,5 CR	Ratz, Zöllner
Compulsory Elective Area (Election: 1 item)			
T-WIWI-110340	Applied Informatics – Applications of Artificial Intelligence	4,5 CR	Färber
T-WIWI-110341	Applied Informatics – Database Systems	4,5 CR	Oberweis
T-WIWI-110342	Applied Informatics – Information Security	4,5 CR	Volkamer
T-WIWI-110339	Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services	4,5 CR	Sunyaev
T-WIWI-110338	Applied Informatics – Modelling	4,5 CR	Oberweis
T-WIWI-110343	Applied Informatics – Software Engineering	4,5 CR	Oberweis

Competence Certificate

- 'Teilleistung' T-WIWI-102747 (compulsory) with written examination according to § 4 Par. 2 No. 1

according to the selected course:

- 'Teilleistung' T-WIWI-110340 (compulsory elective) with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-WIWI-110341 (compulsory elective) with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-WIWI-110342 (compulsory elective) with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-WIWI-110339 (compulsory elective) with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-WIWI-110338 (compulsory elective) with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-WIWI-110343 (compulsory elective) with written examination according to § 4 Par. 2 No. 1

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

The student

- has the capability of dealing with the practical application of the Java programming language (which is the dominating programming language in many application areas)
- knows in depth methods and systems of a core area or a core application area of Informatics according to the contents dealt with in the lectures,
- can choose these methods and system situation adequately and can furthermore design and employ them for problem-solving,
- is able to independently find strategic and creative answers in the finding of solutions to well-defined, concrete, and abstract problems.

Content

In this module, object-oriented programming skills using the Java programming language are further deepened. Based on a core application area, basic methods and techniques of computer science are presented.

Module grade calculation

grade of the module is CP weighted average of grades of the compulsory exam and the selected partial exam

Workload

contact hours (1 HpW = 1 h x 15 weeks), according to the selected course:

- Advanced Programming - Java Network Programming lecture, tutorial, computer lab (compulsory): 90 h
- Applied Informatics – Applications of Artificial Intelligence lecture, exercise (compulsory elective): 45 h
- Applied Informatics – Database Systems lecture, exercise (compulsory elective): 45 h
- Applied Informatics – Information Security lecture, exercise (compulsory elective): 45 h
- Applied Informatics – Principles of Internet Computing lecture, exercise (compulsory elective): 45 h
- Applied Informatics – Modelling lecture, exercise (compulsory elective): 45 h
- Applied Informatics – Software Engineering lecture, exercise (compulsory elective): 45 h

independent study, according to the selected course:

- preparation and follow-up lectures, tutorials Advanced Programming - Java Network Programming: 15 h
- examination preparation Advanced Programming - Java Network Programming (partial examination, compulsory): 30 h
- preparation and follow-up lectures, exercises Applied Informatics – Applications of Artificial Intelligence: 45 h
- examination preparation Applied Informatics – Applications of Artificial Intelligence (partial examination, compulsory elective): 45 h
- preparation and follow-up lectures, exercises Applied Informatics – Database Systems: 45 h
- examination preparation Applied Informatics – Database Systems (partial examination, compulsory elective): 45 h
- preparation and follow-up lectures, exercises Applied Informatics – Information Security: 45 h
- examination preparation Applied Informatics – Information Security (partial examination, compulsory elective): 45 h
- preparation and follow-up lectures, exercises Applied Informatics – Principles of Internet Computing: 45 h
- examination preparation Applied Informatics – Principles of Internet Computing (partial examination, compulsory elective): 45 h
- preparation and follow-up lectures, exercises Applied Informatics – Modelling: 45 h
- examination preparation Applied Informatics – Modelling (partial examination, compulsory elective): 45 h
- preparation and follow-up lectures, exercises Applied Informatics – Software Engineering: 45 h
- examination preparation Applied Informatics – Software Engineering (partial examination, compulsory elective): 45 h

total: 270 h

Recommendation

none

M

5.48 Module: Quality Management (tmbM911) [M-MACH-105332]

Responsible: Prof. Dr.-Ing. Gisela Lanza
Organisation: KIT Department of Mechanical Engineering

Part of: [Project Management and Lean Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	Grade to a tenth	Each winter term	1 term	German	4	2

Mandatory			
T-MACH-102107	Quality Management	4 CR	Lanza

Competence Certificate

- 'Teilleistung' T-MACH-102107 with written examination according to § 4 Par. 2 No. 1
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The students ...

- are capable to comment on the content covered by the module.
- are capable of substantially quality philosophies.
- are able to apply the QM tools and methods they have learned about in the module to new problems from the context of the module.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques they have learned about in the module for a specific problem.

Content

Based on the quality philosophies Total Quality Management (TQM) and Six-Sigma, the module will specifically address the needs of a modern quality management. The process orientation in a modern company and the process-specific fields of quality assurance are presented in detail. Preventive as well as non-preventive quality management methods, which are state of the art in operational practice today, are content of the module. The use of suitable measurement techniques in production engineering (production measurement technology) as well as their potential levels of integration in the production system are discussed. The use of suitable statistical methods for data analysis and their modern extension by methods of artificial intelligence are be discussed. The contents are complemented by legal aspects in the field of quality management.

Main topics of the module:

- The term "Quality"
- Total Quality Management (TQM)
- Six-Sigma and universal methods and tools within the DMAIC cycle
- QM in early product stages – Determination and realization of customer requirements
- QM in product development
- Production measurement Technology
- QM in production - statistical Methods
- Artificial intelligence and machine learning in quality Management
- Operating behaviour and reliability
- Legal aspects in QM

Module grade calculation

grade of the module is grade of the exam

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture: 30 h

independent study:

- preparation and follow-up lectures: 45 h
- examination preparation: 45 h

total: 120 h

Recommendation

none

Learning type

Lecture

M

5.49 Module: Integrated Production Planning in the Age of Industry 4.0 (tmbM912) [M-MACH-105350]

Responsible: Prof. Dr.-Ing. Gisela Lanza

Organisation: KIT Department of Mechanical Engineering

Part of: [Project Management and Lean Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
8	Grade to a third	Each summer term	1 term	German	4	2

Mandatory			
T-MACH-108849	Integrated Production Planning in the Age of Industry 4.0	8 CR	Lanza

Competence Certificate

- 'Teilleistung' T-MACH-108849 with oral examination according to § 4 Par. 2 No. 2
details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The students ...

- can discuss basic questions of production technology.
- are able to apply the methods of integrated production planning they have learned about to new problems.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques they have learned about for a specific problem.
- can apply the learned methods of integrated production planning to new problems.
- can use their knowledge targeted for efficient production technology.

Content

Integrated production planning in the age of industry 4.0 will be taught in the context of this engineering science module. In addition to a comprehensive introduction to Industry 4.0, the following topics will be addressed at the beginning of the module:

- Basics, history and temporal development of production
- Integrated production planning and integrated digital engineering
- Principles of integrated production systems and further development with Industry 4.0

Building on this, the phases of integrated production planning are taught in accordance with VDI Guideline 5200, whereby special features of parts production and assembly are dealt with in the context of case studies:

- Factory planning system
- Definition of objectives
- Data collection and analysis
- Concept planning (structural development, structural dimensioning and rough layout)
- Detailed planning (production planning and control, fine layout, IT systems in an industry 4.0 factory)
- Preparation and monitoring of implementation
- Start-up and series support

The module contents are rounded off by numerous current practical examples with a strong industry 4.0 reference.

Module grade calculation

grade of the module is grade of the exam

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture/exercise: 90 h

independent study:

- preparation and follow-up lecture/exercises: 90 h
- examination preparation: 60 h

total: 240 h

Recommendation

none

Learning type

Lecture

M

5.50 Module: Constitutional and Administrative Law (tmbM913) [M-INFO-101192]

Responsible: Prof. Dr. Nikolaus Marsch
Organisation: KIT Department of Informatics
Part of: [Project Management and Lean Construction](#)
[People and Environment in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each term	2 terms	German	4	5

Mandatory			
T-INFO-110300	Public Law I & II	6 CR	N.N.

Competence Certificate

- 'Teilleistung' T-INFO-110300 with written examination according to § 4 Par. 2 No. 1
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Module grade calculation

grade of the module is grade of the exam

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Public Law I - Basic Principles lecture: 30 h
- Public Law II lecture: 30 h

independent study:

- preparation and follow-up lectures Public Law I - Basic Principles lecture: 30 h
- preparation and follow-up lectures Public Law II: 30 h
- examination preparation: 60 h

total: 180 h

Recommendation

none

M

5.51 Module: Technical Energy Systems for Buildings (tmbM914) [M-MACH-106179]

Responsible: Dr. Ferdinand Schmidt
Organisation: KIT Department of Mechanical Engineering
Part of: [Real Estate and Facility Management](#)
[People and Environment in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
8	Grade to a tenth	Each winter term	2 terms	German	4	1

Mandatory			
T-MACH-105559	Technical Energy Systems for Buildings 1: Processes & Components	4 CR	Schmidt
T-MACH-105560	Technical Energy Systems for Buildings 2: System Concept	4 CR	Schmidt

Competence Certificate

- 'Teilleistung' T-BGU-100624 with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-BGU-100625 with oral examination according to § 4 Par. 2 No. 2

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

After completing the module "Technical Energy Systems for Buildings", students have an overview of the technologies for supplying buildings with heat, cooling and, if necessary, on-site generated electricity. They know the procedures for the ecological, primary energy and economic evaluation of these technologies and can apply them to concrete case studies. They know the development status of the most relevant heating technologies for saving CO₂ emissions and primary energy for existing buildings and can classify the potentials of these technologies for the energy transition in the building sector.

Content

details about the content see at the respective 'Teilleistung'

Module grade calculation

grade of the module is CP weighted average of grades of the partial exams

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- Technical Energy Systems for Buildings 1: Processes & Components lecture: 30 h
- Technical Energy Systems for Buildings 2: System Concept lecture: 30 h

independent study:

- preparation and follow-up lectures Technical Energy Systems for Buildings 1: Processes & Components: 30 h
- examination preparation Technical Energy Systems for Buildings 1: Processes & Components (partial exam): 60 h
- preparation and follow-up lectures Technical Energy Systems for Buildings 2: System Concept: 30 h
- examination preparation Technical Energy Systems for Buildings 2: System Concept (partial exam): 60 h

total: 240 h

Recommendation

none

Learning type

Lecture

Base for

none

M

5.52 Module: Human-oriented Production (tmbM915) [M-MACH-106031]

Responsible: Prof. Dr.-Ing. Barbara Deml
Organisation: KIT Department of Mechanical Engineering
Part of: [Project Management and Lean Construction](#)
[People and Environment in Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
8	Grade to a tenth	Each term	2 terms	German	4	1

Mandatory			
T-MACH-105518	Human Factors Engineering I	4 CR	Deml
Human-oriented Productivity (Election: 1 item as well as 4 credits)			
T-MACH-106374	Human-oriented Productivity Management: Personnel Management	4 CR	Stock
T-MACH-105523	Productivity Management in Production Systems	4 CR	Stowasser

Competence Certificate

- 'Teilleistung' T-MACH-105518 (compulsory) with written examination to § 4 Par. 2 No. 1

according to the selected course:

- 'Teilleistung' T-MACH-106374 (compulsory elective 1) with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-MACH-105523 (compulsory elective 2) with oral examination according to § 4 Par. 2 No. 2

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Module grade calculation

grade of the module is CP weighted average of grades of the compulsory exam and the selected partial exam

Workload

contact hours (1 HpW = 1 h x 15 weeks), according to the selected course:

- Human Factors Engineering I lecture (compulsory): 30 h
- Human-oriented Productivity Management: Personnel Management lecture (compulsory elective 1): 30 h
- Productivity Management in Production Systems lecture (compulsory elective 2): 30 h

independent study, according to the selected course:

- preparation and follow-up lectures Human Factors Engineering I: 45 h
- examination preparation Human Factors Engineering I (partial examination, compulsory): 45 h
- preparation and follow-up lectures Human-oriented Productivity Management: Personnel Management: 45 h
- examination preparation Human-oriented Productivity Management: Personnel Management (partial examination, compulsory elective 1): 45 h
- preparation and follow-up lectures Productivity Management in Production Systems: 45 h
- examination preparation Productivity Management in Production Systems (partial examination, compulsory elective 2): 45 h

total: 240 h

Recommendation

none

M

5.53 Module: Logistics and Supply Chain Management (tmbM916) [M-MACH-105298]

Responsible: Prof. Dr.-Ing. Kai Furmans
Organisation: KIT Department of Mechanical Engineering

Part of: [Project Management and Lean Construction](#)
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each summer term	1 term	English	4	2

Mandatory			
T-MACH-110771	Logistics and Supply Chain Management	9 CR	Furmans

Competence Certificate

- 'Teilleistung' T-MACH-110771 with written examination according to § 4 Par. 2 No. 1
 details about the learning control see at the 'Teilleistung'

Prerequisites

none

Competence Goal

The student

- has comprehensive and well-founded knowledge of the central challenges in logistics and supply chain management, an overview of various practical issues and the decision-making requirements and models in supply chains,
- can model supply chains and logistics systems using simple models with sufficient accuracy,
- identifies cause-effect relationships in supply chains,
- is able to evaluate supply chains and logistics systems based on the methods they have mastered.

Content

Logistics and Supply Chain Management provides comprehensive and well-founded fundamentals for the crucial issues in logistics and supply chain management. Within the scope of the lectures, the interaction of different design elements of supply chains is emphasized. For this purpose, qualitative and quantitative description models are used. Methods for mapping and evaluating logistics systems and supply chains are also covered. The lecture contents are enriched by exercises and case studies and partially the comprehension of the contents is provided by case studies. The interacting of the elements will be shown, among other things, in the supply chain of the automotive industry.

Module grade calculation

grade of the module is grades of the exam

Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture: 60 h

independent study:

- preparation and follow-up lectures: 90 h
- preparation of case studies: 60 h
- examination preparation: 60 h

total: 270 h

Recommendation

none

Learning type

Lectures, tutorials, case studies.

Literature

Knut Alicke: Planung und Betrieb von Logistiknetzwerken: Unternehmensübergreifendes Supply Chain Management, 2003
 Dieter Arnold et. al.: Handbuch Logistik, 2008
 Marc Goetschalkx: Supply Chain Engineering, 2011

M

5.54 Module: Virtual Engineering Construction - A (tmbM917) [M-MACH-105961]

Responsible: Prof. Dr.-Ing. Jivka Ovtcharova
Organisation: KIT Department of Mechanical Engineering

Part of: Digital Technologies in Construction
 Subject-Specific Supplements

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
8	Grade to a tenth	Each winter term	1 term	German/English	4	2

Mandatory			
T-MACH-102123	Virtual Engineering I	4 CR	Ovtcharova
Elective Subject VE Bau A (Election: 1 item)			
T-MACH-109933	Business Administration for Engineers and IT Professionals	4 CR	Sebregondi
T-MACH-106743	IoT Platform for Engineering	4 CR	Ovtcharova
T-MACH-102153	PLM-CAD Workshop	4 CR	Ovtcharova
T-MACH-102181	PLM for Product Development in Mechatronics	4 CR	Eigner
T-MACH-106740	Virtual Engineering Lab	4 CR	Ovtcharova
T-MACH-106741	Virtual Training Factory 4.X	4 CR	Ovtcharova

Competence Certificate

- 'Teilleistung' T-MACH-102123 (compulsory) with written examination according to § 4 Par. 2 No. 1

according to the selected course:

- 'Teilleistung' T-MACH-109933 (compulsory elective) with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-MACH-106743 (compulsory elective) with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-MACH-102153 (compulsory elective) with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-MACH-102181 (compulsory elective) with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-MACH-106740 (compulsory elective) with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-MACH-106741 (compulsory elective) with examination of other type according to § 4 Par. 2 No. 3

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

Students

- can explain the basic methods of virtual engineering for the creation of products and systems,
- are able to classify and exemplarily apply selected validation procedures and methods for the validation of product and production properties,
- can explain the added value of cross-company information technology for the product life cycle,
- can classify management decisions in companies and justify the importance of digitalisation for the processes of product creation.

Content

Virtual engineering methods, simulations, digitalization, product life cycle, operations management, information management

Module grade calculation

grade of the module is CP weighted average of grades of the compulsory exam and the selected partial exam

Workload

contact hours (1 HpW = 1 h x 15 weeks), according to the selected course:

- Virtual Engineering I lecture/exercise (compulsory): 60 h
- Business Administration for Engineers and IT professionals seminar (compulsory elective): 30 h
- IoT Platform for Engineering project (compulsory elective): 100 h
- PLM-CAD Workshop project (compulsory elective, partial examination): 120 h
- PLM for Product Development in Mechatronics lecture (compulsory elective): 30 h
- Virtual Engineering Lab project (compulsory elective, partial examination): 120 h
- Virtual Training Factory 4.X seminar/practical course (compulsory elective): 90 h

independent study, according to the selected course:

- preparation and follow-up lecture/exercises Virtual Engineering I: 30 h
- examination preparation Virtual Engineering I (partial examination, compulsory): 30 h
- preparation seminar report Business Administration for Engineers and IT professionals (partial examination, compulsory elective): 90 h
- preparation final presentation project IoT Platform for Engineering (partial examination, compulsory elective): 20 h
- preparation and follow-up lectures PLM for Product Development in Mechatronics: 45 h
- examination preparation PLM for Product Development in Mechatronics (partial examination, compulsory): 45 h
- preparation of a video and a report Virtual Training Factory 4.X (partial examination, compulsory elective): 30 h

total: 240 h

Recommendation

none

Learning type

Lectures, exercises, project work in teams, written assignments and presentations

M

5.55 Module: Virtual Engineering Construction - B (tmbM918) [M-MACH-105992]

Responsible: Prof. Dr.-Ing. Jivka Ovtcharova
Organisation: KIT Department of Mechanical Engineering

Part of: Digital Technologies in Construction
 Subject-Specific Supplements

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
8	Grade to a tenth	Each summer term	1 term	German/English	4	2

Mandatory			
T-MACH-102124	Virtual Engineering II	4 CR	Ovtcharova
Elective Subject VE Bau B (Election: 1 item)			
T-MACH-109933	Business Administration for Engineers and IT Professionals	4 CR	Sebregondi
T-MACH-106743	IoT Platform for Engineering	4 CR	Ovtcharova
T-MACH-102153	PLM-CAD Workshop	4 CR	Ovtcharova
T-MACH-102181	PLM for Product Development in Mechatronics	4 CR	Eigner
T-MACH-106740	Virtual Engineering Lab	4 CR	Ovtcharova
T-MACH-106741	Virtual Training Factory 4.X	4 CR	Ovtcharova

Competence Certificate

- 'Teilleistung' T-MACH-102124 (compulsory) with written examination according to § 4 Par. 2 No. 1

according to the selected course:

- 'Teilleistung' T-MACH-109933 (compulsory elective) with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-MACH-106743 (compulsory elective) with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-MACH-102153 (compulsory elective) with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-MACH-102181 (compulsory elective) with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-MACH-106740 (compulsory elective) with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-MACH-106741 (compulsory elective) with examination of other type according to § 4 Par. 2 No. 3

details about the learning controls see at the respective 'Teilleistung'

Prerequisites

none

Competence Goal

Students

- have basic knowledge about innovative visualization techniques like Virtual Reality and know feasible application of Virtual Mock-Ups (VMU) for validating product properties,
- are able to estimate potentials and limitations of current Virtual Reality Systems in product creation,
- can explain the added value of cross-company information technology for the product life cycle,
- can classify management decisions in companies and justify the importance of digitalisation for the processes of product creation.

Content

Virtual reality applications, digitalization, product life cycle, operations management, information management

Module grade calculation

grade of the module is CP weighted average of grades of the compulsory exam and the selected partial exam

Workload

contact hours (1 HpW = 1 h x 15 weeks), according to the selected course:

- Virtual Engineering I lecture/exercise (compulsory): 60 h
- Business Administration for Engineers and IT professionals seminar (compulsory elective): 30 h
- IoT Platform for Engineering project (compulsory elective): 100 h
- PLM-CAD Workshop project (compulsory elective, partial examination): 120 h
- PLM for Product Development in Mechatronics lecture (compulsory elective): 30 h
- Virtual Engineering Lab project (compulsory elective, partial examination): 120 h
- Virtual Training Factory 4.X seminar/practical course (compulsory elective): 90 h

independent study, according to the selected course:

- preparation and follow-up lecture/exercises Virtual Engineering I: 30 h
- examination preparation Virtual Engineering I (partial examination, compulsory): 30 h
- preparation seminar report Business Administration for Engineers and IT professionals (partial examination, compulsory elective): 90 h
- preparation final presentation project IoT Platform for Engineering (partial examination, compulsory elective): 20 h
- preparation and follow-up lectures PLM for Product Development in Mechatronics: 45 h
- examination preparation PLM for Product Development in Mechatronics (partial examination, compulsory): 45 h
- preparation of a video and a report Virtual Training Factory 4.X (partial examination, compulsory elective): 30 h

total: 240 h

Recommendation

none

Learning type

Lectures, exercises, project work in teams, written assignments and presentations

M

5.56 Module: Module Master's Thesis (tmbMSC-THESIS) [M-BGU-106121]

Responsible: Studiendekan:in der KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [Master's Thesis](#)

Credits
30

Grading scale
Grade to a tenth

Recurrence
Each term

Duration
1 term

Language
German/English

Level
5

Version
1

Mandatory			
T-BGU-112486	Master's Thesis	30 CR	Studiendekan:in der KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften

Competence Certificate

thesis and final presentation according to § 14 ER/SPO

Prerequisites

Modules in extent of minimum 42 CP has to be passed in order to be admitted to the Master Thesis according to ER/SPO § 14 Par. 1. Results obtained in the module Key Competences [tmbMW0-UEQUAL] cannot be counted for this purpose.

Competence Goal

The student is able to investigate independently a complex problem within a particular research field of his choice in limited time, following scientific methods. He can search autonomously for literature, can find own approaches, can evaluate his results and can classify them according to the state of the art. He is further able to present clearly the essential matter and results in his master thesis and in a comprehensive presentation.

Content

The Master Thesis is an independent written report and comprises the theoretical or experimental work on a complex problem within a particular field of civil engineering with scientific methods. The topic of the master thesis derives from the students choice of a particular field. The student and can make proposals for the topic.

Module grade calculation

The grade of the module results from the evaluation of the Master Thesis and the final presentation.

Annotation

Information about the procedure regarding admission and registration of the Master Thesis see chap. 2.9.

Workload

- working on thesis project: 720 h
- thesis writing: 150 h.
- preparation of presentation: 30 h

total: 900 h

Recommendation

All technical skills and soft skills required for working on the selected topic and the preparation of the thesis should be attained.

M

5.57 Module: Interdisciplinary Qualifications (tmbMW0-UEQUAL) [M-BGU-106122]

Responsible: Studiendekan:in der KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [Interdisciplinary Qualifications](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	pass/fail	Each term	2 terms	German/English	4	2

Election notes

Courses accepted generally by the Examination Committee are available directly as selection option in the module.

For self assignment of taken interdisciplinary qualifications of HoC, ZAK or 'Sprachenzentrums' (SpZ) the 'Teilleistungen' with the title "Self Assignment HoC-ZAK-SpZ ..." have to be selected according to the grading scale, not graded or graded (see module handbook Sect. 2.4). Title and CP of the taken exam are taken over by the assignment.

Interdisciplinary Qualifications (Election: at least 6 credits)			
T-BGU-106765	Introduction to Matlab	3 CR	Ehret
T-BGU-112598	Introduction to Python	3 CR	Cermak, Fuchs
T-BGU-112487	Self Assignment HoC-ZAK-SpZ 1 not graded	2 CR	
T-BGU-112488	Self Assignment HoC-ZAK-SpZ 2 not graded	2 CR	
T-BGU-112489	Self Assignment HoC-ZAK-SpZ 3 not graded	2 CR	
T-BGU-112839	Self Assignment HoC-ZAK-SpZ 7 not graded	2 CR	
T-BGU-112490	Self Assignment HoC-ZAK-SpZ 4 graded	2 CR	
T-BGU-112491	Self Assignment HoC-ZAK-SpZ 5 graded	2 CR	
T-BGU-112492	Self Assignment HoC-ZAK-SpZ 6 graded	2 CR	

Competence Certificate

according to taken courses

Prerequisites

none

Competence Goal

Learning outcomes can be divided into three main complementary categories: 1. Contextual Knowledge

- Students are aware of the cultural context of their position and are in a position to consider the views and interests of others (beyond the boundaries of subject, culture, and language).
- They have enhanced their ability to participate properly and appropriately in academic or public discussions.

2. Practical Focus

- Students have gained an insight into the routines of professional life.
- They have further developed their capability to learn.
- They have improved their scope of action by extending their knowledge of foreign languages.
- They are able to relate their field of experience to basic aspects of business administration and law.

3. Basic Competences

- The students autonomously acquire new knowledge in a planned, specific, and methodologically founded manner and use it for solving tasks and problems.
- They can evaluate own work.
- They possess efficient work techniques, can set priorities, take decisions, and assume responsibility.

Content

With the key competences, the House of Competence (HoC) and the Centre for Cultural and General Studies (ZAK) offer a wide range of courses, which are bundled thematically for better orientation. The contents are explained in detail in the descriptions of the courses on the internet pages of HoC (<https://studium.hoc.kit.edu/index.php/lehrangebot-gesamtuebersicht/>; in German) and ZAK (https://www.zak.kit.edu/english/general_studies.php). Further, courses of the General Studies of ZAK or language courses of the 'Sprachenzentrums' (<https://www.spz.kit.edu/index.php>; in German) can be taken as Interdisciplinary Qualifications.

Module grade calculation

not graded

Annotation

In exceptional cases the Examination Committee can accept or recognize further suitable courses as Interdisciplinary Qualifications which are not listed in the mentioned offers of HoC, ZAK and 'Sprachenzentrum'. Further information about the Interdisciplinary Qualifications (selection, registration, etc.) see Sect. 2.4 (module handbook).

In agreement with the examiner the passing of the respective course can be marked. This mark is not considered for the grade of the module as the module is not graded.

Workload

according to taken courses; see course description of HoC, lecture descriptions of ZAK, descriptions of language courses

Recommendation

none

M**5.58 Module: Further Examinations (tmbMZL) [M-BGU-106178]****Organisation:** University**Part of:** [Additional Examinations](#)

Credits 30	Grading scale pass/fail	Recurrence Each term	Duration 1 term	Language German	Level 4	Version 1
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M

5.59 Module: Supplementary Studies on Culture and Society [M-ZAK-106235]

Responsible: Dr. Christine Mielke
Christine Myglas

Organisation:

Part of: [Additional Examinations](#) (Usage from 4/1/2023)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
22	Grade to a tenth	Each term	3 terms	German	4	1

Election notes

With the exception of the final oral exam and the practice module, students have to self-record the achievements obtained in the Supplementary Studies on Culture and Society in their study plan. ZAK records the achievements as "non-assigned" under "ÜQ/SQ-Leistungen". Further instructions on self-recording of achievements can be found in the FAQ at <https://campus.studium.kit.edu/> and on the ZAK homepage at <https://www.zak.kit.edu/begleitstudium-bak.php>. The title of the examination and the amount of credits override the modules placeholders.

If you want to use ZAK achievements **both for your interdisciplinary qualifications and for the supplementary studies**, please record them in the interdisciplinary qualifications first. You can then get in contact with the ZAK study services (stg@zak.kit.edu) to also record them in your supplementary studies.

In the in-depth module, achievements have to be obtained in three different areas. The areas are as follows:

- Technology & Responsibility
- Doing Culture
- Media & Aesthetics
- Spheres of Life
- Global Cultures

You have to obtain two achievements with 3 credits each and one achievement with 5 credits. To self-record achievements in the in-depth module, you first have to elect the matching partial achievement.

Note: If you registered for the Supplementary Studies on Sustainable Development before April 1st, 2023, self-recording an achievement in this module counts as a request in the sense of §20 (2) of the regulations for the Supplementary Studies on Culture and Society. Your overall grade for the supplementary studies will thus be calculated as the average of the examination grades, not as the average of the module grades.

Mandatory			
T-ZAK-112653	Basics Module - Self Assignment BAK	3 CR	Mielke, Myglas
In-depth Module (Election: 3 items)			
T-ZAK-112654	In-depth Module - Technology & Responsibility - Self Assignment BAK	3 CR	Mielke, Myglas
T-ZAK-112655	In-depth Module - Doing Culture - Self Assignment BAK	3 CR	Mielke, Myglas
T-ZAK-112656	In-depth Module - Media & Aesthetics - Self Assignment BAK	3 CR	Mielke, Myglas
T-ZAK-112657	In-depth Module - Spheres of Life - Self Assignment BAK	3 CR	Mielke, Myglas
T-ZAK-112658	In-depth Module - Global Cultures - Self Assignment BAK	3 CR	Mielke, Myglas
Mandatory			
T-ZAK-112660	Practice Module	4 CR	Mielke, Myglas
T-ZAK-112659	Oral Exam - Supplementary Studies on Culture and Society	4 CR	Mielke, Myglas

Competence Certificate

The monitoring is explained in the respective partial achievement.

They are composed of:

- minutes
- presentations
- a seminar paper
- an internship report
- an oral examination

After successful completion of the supplementary studies, the graduates receive a graded certificate and a KIT certificate.

Prerequisites

The offer is study-accompanying and does not have to be completed within a defined period of time. Enrolment or acceptance for graduation must be present when registering for the final examination.

KIT students register for the supplementary studies by selecting this module in the student portal and self-checking a performance. In addition, registration for the individual courses is necessary, which is possible shortly before the beginning of each semester.

The course catalogue, statutes (study regulations), registration form for the oral exam, and guides for preparing the various written performance requirements can be found as downloads on the ZAK homepage at www.zak.kit.edu/begleitstudium-bak.

Competence Goal

Graduates of the Supplementary Studies on Culture and Society demonstrate a sound basic knowledge of conditions, procedures and concepts for analysing and shaping fundamental social development tasks in connection with cultural topics. They have gained a well-founded theoretical and practical insight into various cultural studies and interdisciplinary topics in the field of tension between culture, technology and society in the sense of an expanded concept of culture.

They are able to place the contents selected from the specialization module in the basic context as well as to analyse and evaluate the contents of the selected courses independently and exemplarily and to communicate about them scientifically in written and oral form. Graduates are able to analyse social topics and problem areas and critically reflect on them in a socially responsible and sustainable perspective.

Content

The Supplementary Studies on Culture and Society can be started from the 1st semester and is not limited in time. It comprises at least 3 semesters. The supplementary studies are divided into 3 modules (basics, in-depth studies, practice). A total of 22 credit points (ECTS) are earned.

The thematic elective areas of the supplementary studies are divided into the following 5 modules and their sub-topics:

Block 1 Technology & Responsibility

Value change / ethics of responsibility, technology development / history of technology, general ecology, sustainability

Block 2 Doing Culture

Cultural studies, cultural management, creative industries, cultural institutions, cultural policy

Block 3 Media & Aesthetics

Media communication, cultural aesthetics

Block 4 Spheres of Life

Cultural sociology, cultural heritage, architecture and urban planning, industrial science

Block 5 Global Cultures

Multiculturalism / interculturalism / transculturalism, science and culture

Module grade calculation

The overall grade of the supplementary studies is calculated as an average of the grades of the examination performances weighted with credit points.

In-depth Module

- presentation 1 (3 ECTS)
- presentation 2 (3 ECTS)
- seminar paper incl. presentation (5 ECTS)
- oral examination (4 ECTS)

Annotation

With the Supplementary Studies on Culture and Society, KIT provides a multidisciplinary study offer as an additional qualification, with which the respective specialized study program is supplemented by interdisciplinary basic knowledge and interdisciplinary orientation knowledge in the field of cultural studies, which is becoming increasingly important for all professions.

Within the framework of the supplementary studies, students acquire in-depth knowledge of various cultural studies and interdisciplinary subject areas in the field of tension between culture, technology and society. In addition to high culture in the classical sense, other cultural practices, common values and norms as well as historical perspectives of cultural developments and influences are considered.

In the courses, conditions, procedures and concepts for the analysis and design of fundamental social development tasks are acquired on the basis of an expanded concept of culture. This includes everything created by humans - also opinions, ideas, religious or other beliefs. The aim is to develop a modern concept of cultural diversity. This includes the cultural dimension of education, science and communication as well as the preservation of cultural heritage. (UNESCO, 1982)

According to § 16 of the statutes, a reference and a certificate are issued by the ZAK for the supplementary studies. The achievements are also shown in the transcript of records of the degree program and, upon request, in the certificate. They can also be recognized in the interdisciplinary qualifications (see elective information).

Workload

The workload is made up of the recommended number of hours for the individual modules:

- basic module approx. 90 h
- in-depth module approx. 340 h
- practical module approx. 120 h

total: approx. 550 h

Learning type

- lectures
- seminars
- workshops
- practical course

Literature

Recommended reading of primary and specialized literature will be determined individually by each instructor.

M

5.60 Module: Supplementary Studies on Sustainable Development [M-ZAK-106099]

Responsible: Dr. Christine Mielke
Christine Myglas

Organisation:

Part of: [Additional Examinations](#) (Usage from 4/1/2023)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
19	Grade to a tenth	Each term	3 terms	German	4	1

Election notes

With the exception of the final oral exam, students have to self-record the achievements obtained in the Supplementary Studies on Sustainable Development in their study plan. ZAK records the achievements as "non-assigned" under "ÜQ/SQ-Leistungen". Further instructions on self-recording of achievements can be found in the FAQ at <https://campus.studium.kit.edu/> and on the ZAK homepage at <https://www.zak.kit.edu/begleitstudium-bene>. The title of the examination and the amount of credits override the modules placeholders.

If you want to use ZAK achievements **both for your interdisciplinary qualifications and for the supplementary studies**, please record them in the interdisciplinary qualifications first. You can then get in contact with the ZAK study services (stg@zak.kit.edu) to also record them in your supplementary studies.

In the elective module, you need to obtain 6 credits worth of achievements in two of the four areas:

- Sustainable Cities & Neighbourhoods
- Sustainable Assessment of Technology
- Subject, Body, Individual: The Other Side of Sustainability
- Sustainability in Culture, Economy & Society

Usually, two achievements with 3 credits each have to be obtained. To self-record achievements in the elective module, you first have to elect the matching partial achievement.

Note: If you registered for the Supplementary Studies on Sustainable Development before April 1st, 2023, self-recording an achievement in this module counts as a request in the sense of §19 (2) of the regulations for the Supplementary Studies on Sustainable Development. Your overall grade for the supplementary studies will thus be calculated as the average of the examination grades, not as the average of the module grades.

Mandatory			
T-ZAK-112345	Basics Module - Self Assignment BeNe	3 CR	Myglas
Elective Module (Election: at least 6 credits)			
T-ZAK-112347	Elective Module - Sustainable Cities and Neighbourhoods - Self Assignment BeNe	3 CR	
T-ZAK-112348	Elective Module - Sustainability Assessment of Technology - Self Assignment BeNe	3 CR	
T-ZAK-112349	Elective Module - Subject, Body, Individual: the Other Side of Sustainability - Self Assignment BeNe	3 CR	
T-ZAK-112350	Elective Module - Sustainability in Culture, Economy and Society - Self Assignment BeNe	3 CR	
Mandatory			
T-ZAK-112346	Specialisation Module - Self Assignment BeNe	6 CR	Myglas
T-ZAK-112351	Oral Exam - Supplementary Studies on Sustainable Development	4 CR	

Competence Certificate

The monitoring is explained in the respective partial achievement .

They are composed of:

- protocols
- a reflection report
- presentations
- presentations
- the elaboration of a project work
- an individual term paper

Upon successful completion of the supplementary studies, graduates receive a graded report and a certificate issued by ZAK.

Prerequisites

The course is offered during the course of study and does not have to be completed within a defined period of time. Enrolment is required for all performance assessments of the modules of the supplementary studies. Participation in the supplementary studies is regulated by § 3 of the statutes.

KIT students register for the supplementary studies by selecting this module in the student portal and self-booking a performance. Registration for courses, performance assessments and examinations is regulated by § 6 of the Statutes and is usually possible shortly before the beginning of the semester.

The course catalogue, statutes (study regulations), registration form for the oral exam and guidelines for preparing the various written performance requirements can be found as downloads on the ZAK homepage at <http://www.zak.kit.edu/begleitstudium-bene>.

Competence Goal

Graduates of the supplementary studies in sustainable development acquire additional practical and professional competencies. Thus, the supplementary study program enables the acquisition of basics and initial experience in project management, trains teamwork skills, presentation skills and self-reflection, and also creates a fundamental understanding of sustainability that is relevant for all professional fields.

Graduates are able to analyse social topics and problem areas and critically reflect on them in a socially responsible and sustainable perspective. They are able to place the contents selected from the modules "Elective" and "Advanced" in the basic context as well as to independently and exemplarily analyse and evaluate the contents of the selected courses and to scientifically communicate about them in written and oral form.

Content

The supplementary study program Sustainable Development can be started from the 1st semester and is not limited in time. The wide range of courses offered by ZAK makes it possible to complete the program usually within three semesters. The supplementary studies comprise 19 credit points (LP). It consists of three modules: Basic Module, Elective Module and Advanced Module.

The thematic elective areas of the supplementary studies are divided into the following 4 modules and their subtopics in Module 2 (elective module):

Block 1 Sustainable Cities and Neighbourhoods

The courses provide an overview of the interaction of social, ecological, and economic dynamics in the microcosm of the city.

Block 2 Sustainability Assessment of Technology

Mostly based on ongoing research activities, methods and approaches of technology assessment are elaborated.

Block 3 Subject, Body, Individual: The other Side of Sustainability

Different approaches are presented to the individual perception, experience, shaping and responsibility of relationships to the environment and to oneself.

Block 4 Sustainability in Culture, Economy & Society

Courses usually have an interdisciplinary approach, but may also focus on one of the areas of culture, economics or society, both in application and in theory.

The core of the supplementary studies is a case study in the specialization area. In this project seminar, students conduct sustainability research with practical relevance themselves. The case study is supplemented by an oral examination with two topics from module 2 (elective module) and module 3 (in-depth module).

Module grade calculation

The overall grade of the supplementary studies is calculated as an average of the grades of the examination performances weighted with credit points.

Elective module

- Presentation 1 (3 ECTS)
- Presentation 2 (3 ECTS)

Advanced module

- individual term paper (6 ECTS)
- oral examination (4 ECTS)

Annotation

The Supplementary Studies on Sustainable Development at KIT is based on the conviction that a long-term socially and ecologically compatible coexistence in the global world is only possible if knowledge about necessary changes in science, economy and society is acquired and applied.

The interdisciplinary and transdisciplinary Studies on Sustainable Development enables diverse access to transformation knowledge as well as basic principles and application areas of sustainable development. According to the statutes § 16, a certificate is issued by the ZAK for the complementary studies.

The achievements are also shown in the transcript of records of the degree program and, upon request, in the certificate. They can also be recognized in the interdisciplinary qualifications (see elective information).

In the specialised studies, modules and partial achievements can be recognised within the framework of the additional achievements or e.g. the interdisciplinary qualifications. This must be regulated via the respective subject study programme.

The focus is on experience- and application-oriented knowledge and competences, but theories and methods are also learned. The aim is to be able to represent one's own actions as a student, researcher and later decision-maker as well as an individual and part of society under the aspect of sustainability.

Sustainability is understood as a guiding principle to which economic, scientific, social and individual actions should be oriented. According to this, the long-term and socially just use of natural resources and the material environment for a positive development of global society can only be addressed by means of integrative concepts. Therefore, "education for sustainable development" in the sense of the United Nations programme plays just as central a role as the goal of promoting "cultures of sustainability". For this purpose, practice-centred and research-based learning of sustainability is made possible and the broad concept of culture established at ZAK is used, which understands culture as habitual behaviour, lifestyle and changing context for social actions.

The supplementary study programme conveys the basics of project management, trains teamwork skills, presentation skills and self-reflection. Complementary to the specialised studies at KIT, it creates a fundamental understanding of sustainability, which is important for all professional fields. Integrative concepts and methods are essential: in order to use natural resources in the long term and to shape the global future in a socially just way, not only different disciplines, but also citizens, practitioners and institutions must work together.

Workload

The workload is made up of the number of hours of the individual modules:

- Basic module approx. 180 h
- Elective module approx. 150 h
- Consolidation module approx. 180 h

Total: approx. 510 h

Learning type

- lectures
- seminars
- workshops

Literature

Recommended reading of primary and specialist literature is determined individually by the respective lecturer.

6 Courses

T




6.1 Course: Advanced Programming - Java Network Programming [T-WIWI-102747]





Responsible: Prof. Dr. Dietmar Ratz
Prof. Dr.-Ing. Johann Marius Zöllner

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-106034 - Applied Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	4

Events					
ST 2024	2511020	Advanced Programming - Java Network Programming	2 SWS	Lecture / 	Ratz
ST 2024	2511021	Tutorium zu Programmierung kommerzieller Systeme - Anwendungen in Netzen mit Java	1 SWS	Tutorial (/ )	Ratz, Stegmaier, Schneider, Mütsch
ST 2024	2511023	Rechnerpraktikum zu Programmierung kommerzieller Systeme - Anwendungen in Netzen mit Java	2 SWS	/ 	Ratz, Stegmaier, Schneider, Mütsch

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 90 min.

Prerequisites

none

Recommendation

none

Annotation

The registration for the participation in the computer lab (precondition for the exam participation) already takes place in the first lecture week!

T

6.2 Course: Advanced Studies in Construction Engineering [T-BGU-108003]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100344 - Advanced Studies in Construction Engineering](#)




Type
Written examination





Credits
6

Grading scale
Grade to a third

Recurrence
Each term

Version
1

Events					
WT 23/24	6241903	Tunnelbau und Sprengtechnik	2 SWS	Lecture / 	Haghsheno, Scheuble
WT 23/24	6241904	Tiefbau	1 SWS	Lecture / 	Haghsheno, Schneider
WT 23/24	6241905	Erdbau	1 SWS	Lecture / 	Haghsheno, Schwarzweiler

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 90 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.3 Course: Agile Project Management in Facility and Real Estate Management [T-BGU-111906]





Responsible: Prof. Dr.-Ing. Kunibert Lennerts

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [M-BGU-105920 - Agile Project Management in Facility and Real Estate Management](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	6	Grade to a third	Each summer term	1 terms	1

Events					
ST 2024	6242805	Agile Project Management in Facility and Real Estate Management	4 SWS	Lecture / Practice (/)	Lennerts

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

project:

report, appr. 10 pages, and
presentation, appr. 10 min.

Prerequisites

none

Recommendation

none

Annotation


none





T

6.4 Course: Applied Building Physics [T-BGU-100039]

Responsible: N.N.
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-103950 - Building Physics I](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	3	Grade to a third	Each term	3

Events					
WT 23/24	6211909	Angewandte Bauphysik	2 SWS	Lecture / 	Vogel, Dehn, Altmann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 20 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.5 Course: Applied Informatics – Applications of Artificial Intelligence [T-WIWI-110340]

Responsible: Dr.-Ing. Michael Färber
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-106034 - Applied Informatics](#)

Type
Written examination

Credits
4,5

Grading scale
Grade to a third

Recurrence
Each winter term

Version
2

Events					
WT 23/24	2511314	Applied Informatics - Applications of Artificial Intelligence	2 SWS	Lecture / 🔄	Färber, Käfer
WT 23/24	2511315	Exercises to Applied Informatics - Applications of Artificial Intelligence	1 SWS	Practice / 🎯	Färber, Käfer, Qu , Yuan

Legend: 📺 Online, 🔄 Blended (On-Site/Online), 🎯 On-Site, ✕ Cancelled

Competence Certificate

written exam, 60 min.

Prerequisites

none

Recommendation

Basics in logic, e.g. from lecture Foundations of Informatics 1 are important.

Annotation

none

T

6.6 Course: Applied Informatics – Database Systems [T-WIWI-110341]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-106034 - Applied Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	2

Events					
ST 2024	2511200	Applied Informatics - Database Systems	2 SWS	Lecture / 🗣️	Sommer
ST 2024	2511201	Exercises Applied Informatics - Database Systems	1 SWS	Practice / 🗣️	Sommer

Legend: 🖥️ Online, 🔄 Blended (On-Site/Online), 🗣️ On-Site, ✖ Cancelled

Competence Certificate

written exam, 60 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.7 Course: Applied Informatics – Information Security [T-WIWI-110342]

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-106034 - Applied Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	4

Events					
ST 2024	2511550	Applied Informatics - Information Security	2 SWS	Lecture / 🗎	Volkamer
ST 2024	2511551	Exercise Applied Informatics - Information Security	1 SWS	Practice / 🗎	Volkamer, Berens, Ballreich

Legend: 🗎 Online, 🗎 Blended (On-Site/Online), 🗎 On-Site, ✕ Cancelled

Competence Certificate

written exam, 60 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.8 Course: Applied Informatics – Modelling [T-WIWI-110338]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-106034 - Applied Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	2

Events					
WT 23/24	2511030	Applied Informatics - Modelling	2 SWS	Lecture / 🗣️	Oberweis, Schiefer, Schüler
WT 23/24	2511031	Exercises to Applied Informatics - Modelling	1 SWS	Practice / 🗣️	Oberweis, Schiefer, Schüler

Legend: 🖥️ Online, 🔄 Blended (On-Site/Online), 🗣️ On-Site, ✖ Canceled

Competence Certificate

written exam, 60 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.9 Course: Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services [T-WIWI-110339]

Responsible: Prof. Dr. Ali Sunyaev
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-106034 - Applied Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	2

Events					
ST 2024	2511032	Applied Informatics - Internet Computing	2 SWS	Lecture / 🎤	Sunyaev
ST 2024	2511033	Übungen zu Angewandte Informatik - Internet Computing	1 SWS	Practice / 🔄	Sunyaev, Rank, Guse

Legend: 📺 Online, 🔄 Blended (On-Site/Online), 🎤 On-Site, ✕ Cancelled

Competence Certificate

written exam, 60 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.10 Course: Applied Informatics – Software Engineering [T-WIWI-110343]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-106034 - Applied Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	2

Events					
ST 2024	2511206	Applied Informatics - Software Engineering	2 SWS	Lecture / 🎤	Oberweis
ST 2024	2511207	Übungen zu Angewandte Informatik - Software Engineering	1 SWS	Practice / 🎤	Oberweis, Forell, Frister, Schüler, Fritsch

Legend: 📺 Online, 🔄 Blended (On-Site/Online), 🎤 On-Site, ✖ Cancelled

Competence Certificate

written exam, 60 min.

Prerequisites

none

Recommendation

none

Annotation



none





T

6.11 Course: Basics in Computer Vision (2D/3D) [T-BGU-101166]

Responsible: Prof. Dr.-Ing. Stefan Hinz
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100674 - 2D/3D Image Analysis and Image Based Tracking Methods](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	3	Grade to a third	Each winter term	2

Events					
WT 23/24	6041101	2D Computer Vision	1 SWS	Lecture / 	Ulrich
WT 23/24	6041102	3D Computer Vision	2 SWS	Lecture / 	Jutzi

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 30 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.12 Course: Basics Module - Self Assignment BAK [T-ZAK-112653]

Responsible: Dr. Christine Mielke
Christine Myglas

Organisation:

Part of: [M-ZAK-106235 - Supplementary Studies on Culture and Society](#)

Type	Credits	Grading scale	Version
Completed coursework	3	pass/fail	1

Competence Certificate

The monitoring in this module includes a course credit according to § 5 section 4 in the form of minutes of which two are to be handed in freely chosen topics of the lecture series " Introduction to Applied Studies on Culture and Society ". Length: approx. 6,000 characters each (incl. spaces).

Self service assignment of supplementary studies

This course can be used for self service assignment of grade aquired from the following study providers:

- Zentrum für Angewandte Kulturwissenschaft und Studium Generale
- ZAK Begleitstudium

Recommendation

Fjordevik, Anneli und Jörg Roche: Angewandte Kulturwissenschaften. Vol. 10. Narr Francke Attempto Verlag, 2019.

Annotation

The Basic Module consists of the lecture "Introduction to Supplementary Studies on Culture and Society", which is offered only in the winter semester. It is therefore recommended that students start their studies in the winter semester and complete them before module 2.

T

6.13 Course: Basics Module - Self Assignment BeNe [T-ZAK-112345]**Responsible:** Christine Myglas**Organisation:****Part of:** [M-ZAK-106099 - Supplementary Studies on Sustainable Development](#)

Type	Credits	Grading scale	Version
Completed coursework	3	pass/fail	1

Competence Certificate

The monitoring in this module includes a course credit according to § 5 section 4:

[Introduction to Sustainable Development](#) in the form of minutes of which two are to be handed in freely chosen topics of the lecture series "Introduction to Sustainable Development". Length: approx. 6,000 characters each (incl. spaces).

or

[Sustainability Spring Days at KIT](#) in the form of a reflection report on all components of the project days "Sustainability Spring Days at KIT". Length approx. 12,000 characters (incl. spaces).

Prerequisites

None

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- Zentrum für Angewandte Kulturwissenschaft und Studium Generale
- ZAK Begleitstudium

Recommendation

Kropp, Ariane: Grundlagen der Nachhaltigen Entwicklung: Handlungsmöglichkeiten und Strategien zur Umsetzung. Springer-Verlag, 2018.

Pufé, Iris: Nachhaltigkeit. 3. überarb. Edition, UTB, 2017.

Roorda, Niko, et al.: Grundlagen der nachhaltigen Entwicklung. Springer-Verlag, 2021.

Annotation

Module Basics consists of the lecture " Introduction to Sustainable Development ", which is only offered in the summer semester or alternatively of the project days " Sustainability Spring Days at KIT ", which is only offered in the winter semester. It is recommended to complete the course before Elective Module an Specialisation Module.


In exceptional cases, Elective Module or Specialisation Module can also be completed simultaneously with Basics Module. However, the prior completion of the advanced modules Elective and Specialisation should be avoided.





T

6.14 Course: Brownfield Sites - Investigation, Evaluation, Rehabilitation [T-BGU-100089]

Responsible: Dr.-Ing. Andreas Bieberstein
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100079 - Environmental Geotechnics](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	3	Grade to a third	Each winter term	1

Events					
WT 23/24	6251915	Brownfield Sites - Investigation, Evaluation, Rehabilitation	2 SWS	Lecture / 	Bieberstein, Eiche, Würdemann, Mohrlok

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 20 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.15 Course: Building Information Modeling (BIM) [T-BGU-108007]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-103916 - Building Information Modeling \(BIM\)](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	6	Grade to a third	Each summer term	1

Events					
ST 2024	6241812	Building Information Modeling	4 SWS	Lecture / Practice (/)	Haghsheno

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

project report appr. 10 pages and presentation appr. 10 min.

Prerequisites

none

Recommendation

none

Annotation

none

T




6.16 Course: Building Preservation of Concrete and Masonry Constructions [T-BGU-100038]

Responsible: Dr.-Ing. Michael Vogel

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [M-BGU-100058 - Building Preservation of Concrete and Masonry Constructions](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	5	Grade to a third	Each term	2

Events					
ST 2024	6211811	Protection, Rehabilitation and Reinforcement of Concrete and Masonry Constructions	2 SWS	Lecture / 	Vogel
ST 2024	6211812	Exercises to Protection, Rehabilitation and Reinforcement of Concrete and Masonry Constructions	1 SWS	Practice / 	Vogel
ST 2024	6211813	Building Analysis	1 SWS	Lecture / 	Vogel

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 30 min.

Prerequisites

none

Recommendation

none

Annotation


none





T

6.17 Course: Building Technology [T-BGU-100040]

Responsible: PD Dr.-Ing. Stephan Wirth
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-103950 - Building Physics I](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	3	Grade to a third	Each term	2

Events					
WT 23/24	6211910	Gebäudetechnik	2 SWS	Lecture / 	Wirth

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 20 min.

Prerequisites

none

Recommendation

none

Annotation

none

T



6.18 Course: Business Administration for Engineers and IT Professionals [T-MACH-109933]





Responsible: Heinz-Peter Sebgondi

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-105961 - Virtual Engineering Construction - A](#)
[M-MACH-105992 - Virtual Engineering Construction - B](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each term	2

Events					
WT 23/24	2122303	Business Administration for Engineers and IT professionals	2 SWS	Seminar / 	Sebgondi
ST 2024	2122303	Business Administration for Engineers and IT professionals	2 SWS	Seminar / 	Sebgondi

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

2 presentations, appr. 10 min. each, seminar report in 6 parts, approx. 10 pages each part; working on the topics in teams

Prerequisites

none

Recommendation

none

Annotation



none

T

6.19 Course: Decommissioning of Nuclear Facilities [T-BGU-100627]

Responsible: Prof. Dr.-Ing. Sascha Gentes
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100345 - Decommissioning of Nuclear Facilities](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	6	Grade to a third	Each term	1

Events					
WT 23/24	6243901	Demontage und Dekontamination von kerntechnischen Anlagen	2 SWS	Lecture / Practice (/ )	Gentes, Mitarbeiter/innen
WT 23/24	6243903	Neuentwicklungen und Optimierungen in der Maschinentechnik der Demontage und des Rückbaus	2 SWS	Lecture / Practice (/ )	Gentes, Mitarbeiter/innen

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 30 min.

Prerequisites

keine

Recommendation

none

Annotation



none

T

6.20 Course: Design Thinking [T-WIWI-102866]

Responsible: Prof. Dr. Orestis Terzidis
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-106035 - Entrepreneurship \(EnTechnon\)](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Irregular	1

Events					
WT 23/24	2545008	Design Thinking (Track 1)	2 SWS	Seminar / 	Jochem, Terzidis
ST 2024	2545008	Design Thinking (Track 1)	2 SWS	Seminar / 	Bhargava, Jochem, Terzidis

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

development and testing of a prototype product in teams

Prerequisites

none

Recommendation

none

Annotation

The seminar content will be published on the website of the institute.

T

6.21 Course: Digital Engineering and Construction [T-BGU-111695]

Responsible: Jun.-Prof. Dr. Reza Maalek
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-105830 - Digital Engineering and Construction](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	6	Grade to a third	Each winter term	1 terms	1

Events					
WT 23/24	6244901	Digital Engineering and Construction	4 SWS	Lecture / Practice (/)	Maalek

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

4 weekly assignments, term paper approx. 10 pages, presentation approx. 15-20 min.

Prerequisites

none

Recommendation

none

Annotation


none

T

6.22 Course: Digital Planning and Building Information Modeling [T-BGU-110382]

Responsible: Dr.-Ing. Tim Zinke
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-105135 - Digital Planning and Building Information Modeling](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	6	Grade to a third	Each winter term	1 terms	1

Events					
WT 23/24	6212912	Digital Planning and Building Information Modeling	4 SWS	Lecture / Practice (/ )	Zinke

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

preparation of BIM flat pattern plan and report, approx. 20 pages, with presentation, approx. 10 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.23 Course: Digital Technologies in Field Information Modeling [T-BGU-111276]

Responsible: Jun.-Prof. Dr. Reza Maalek
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-105638 - Digital Technologies in Field Information Modeling](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	6	Grade to a third	Each term	1 terms	2

Events					
ST 2024	6244801	Digital Technologies in Field Information Modeling	4 SWS	Lecture / Practice (/)	Maalek

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

4 weekly assignments, term paper approx. 10 pages, presentation approx. 15 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.24 Course: Digitalization in Facility and Real Estate Management [T-BGU-108941]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-104348 - Digitalization in Facility and Real Estate Management](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	6	Grade to a third	Each term	1

Events					
WT 23/24	6242907	Digitization in Facility- and Real Estate Management	4 SWS	Lecture / Practice (/ ●)	Lennerts, Mitarbeiter/innen

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

project work incl. report, appr. 15 pages, and presentation/colloquium, appr. 15 min

Prerequisites

none

Recommendation

none

Annotation

none

T

6.25 Course: Elective Module - Subject, Body, Individual: the Other Side of Sustainability - Self Assignment BeNe [T-ZAK-112349]

Organisation:

Part of: [M-ZAK-106099 - Supplementary Studies on Sustainable Development](#)

Type	Credits	Grading scale	Version
Examination of another type	3	Grade to a third	1

Competence Certificate

Examination of another kind according to § 7 section 7 in the form of a presentation in the selected course.

Prerequisites

Prerequisite for the 'Oral Examination' is the successful completion of Modules 1 and 3 and the required elective sections in Module 2.

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- Zentrum für Angewandte Kulturwissenschaft und Studium Generale
- ZAK Begleitstudium

Recommendation

The content of the Basics Module is helpful.

T

6.26 Course: Elective Module - Sustainability Assessment of Technology - Self Assignment BeNe [T-ZAK-112348]

Organisation:

Part of: [M-ZAK-106099 - Supplementary Studies on Sustainable Development](#)

Type	Credits	Grading scale	Version
Examination of another type	3	Grade to a third	1

Competence Certificate

Examination of another kind according to § 7 section 7 in the form of a presentation in the selected course.

Prerequisites

Prerequisite for the 'Oral Examination' is the successful completion of Modules 1 and 3 and the required elective sections in Module 2.

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- Zentrum für Angewandte Kulturwissenschaft und Studium Generale
- ZAK Begleitstudium

Recommendation

The content of the Basics Module is helpful.

T

6.27 Course: Elective Module - Sustainability in Culture, Economy and Society - Self Assignment BeNe [T-ZAK-112350]

Organisation:

Part of: [M-ZAK-106099 - Supplementary Studies on Sustainable Development](#)

Type	Credits	Grading scale	Version
Examination of another type	3	Grade to a third	1

Competence Certificate

Examination of another kind according to § 7 section 7 in the form of a presentation in the selected course.

Prerequisites

Prerequisite for the 'Oral Examination' is the successful completion of Modules 1 and 3 and the required elective sections in Module 2.

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- Zentrum für Angewandte Kulturwissenschaft und Studium Generale
- ZAK Begleitstudium

Recommendation

The content of the Basics Module is helpful.

T

6.28 Course: Elective Module - Sustainable Cities and Neighbourhoods - Self Assignment BeNe [T-ZAK-112347]

Organisation: University

Part of: [M-ZAK-106099 - Supplementary Studies on Sustainable Development](#)

Type	Credits	Grading scale	Version
Examination of another type	3	Grade to a third	1

Competence Certificate

Examination of another kind according to § 7 section 7 in the form of a presentation in the selected course.

Prerequisites

Prerequisite for the 'Oral Examination' is the successful completion of Modules 1 and 3 and the required elective sections in Module 2.

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- Zentrum für Angewandte Kulturwissenschaft und Studium Generale
- ZAK Begleitstudium

Recommendation

The content of the Basics Module is helpful.





T

6.29 Course: Emissions into the Environment [T-WIWI-102634]

Responsible: Ute Karl
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-106036 - Environmental Emissions and Life Cycle Assessment](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each winter term	1

Events					
WT 23/24	2581962	Emissions into the Environment	2 SWS	Lecture / 	Karl

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 60 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.30 Course: Energy and Indoor Climate Concepts [T-ARCH-107406]

Responsible: Prof. Andreas Wagner
Organisation: KIT Department of Architecture
Part of: [M-ARCH-103663 - Energy and Indoor Climate Concepts](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each summer term	2

Competence Certificate

Completed coursework consisting of working on a project (building analysis) and an oral exam (30 minutes).

Prerequisites

none

T

6.31 Course: Entrepreneurship [T-WIWI-102864]

Responsible: Prof. Dr. Orestis Terzidis
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-106035 - Entrepreneurship \(EnTechnon\)](#)



Type
Written examination




Credits
3

Grading scale
Grade to a third

Recurrence
Each term

Version
1

Events					
WT 23/24	2545001	Entrepreneurship	2 SWS	Lecture / 	Terzidis
ST 2024	2545001	Entrepreneurship	2 SWS	Lecture / 	Terzidis, Dang

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Students are offered the opportunity to earn a grade bonus through separate assignments. If the grade of the written exam is between 4.0 and 1.3, the bonus improves the grade by a maximum of one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the lecture.

Prerequisites

None

Recommendation



None



T

6.32 Course: Environmental Communication [T-BGU-101676]

Responsible: Dr. rer. nat. Charlotte Kämpf
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-101108 - Environmental Communication](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	6	Grade to a third	Each term	2

Events					
WT 23/24	6224905	Umweltkommunikation / Environmental Communication	2 SWS	Seminar / 	Kämpf
ST 2024	6224905	Environmental Communication	2 SWS	Seminar / 	Kämpf

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

presentation, appr. 15 min.,
manuscript, appr. 6000 words, and
Poster DIN-A3

Prerequisites

The accomplishment 'Examination Prerequisite Environmental Communication' (T-BGU-106620) has to be passend.

Modeled Conditions

The following conditions have to be fulfilled:

1. The course [T-BGU-106620 - Examination Prerequisite Environmental Communication](#) must have been passed.

Recommendation

none

Annotation


none





T

6.33 Course: Environmental Law [T-BGU-111102]

Responsible: Dr. Ulrich Smeddinck
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-106042 - Environmental Law](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	3	Grade to a third	Each winter term	1 terms	1

Events					
WT 23/24	6111177	Environmental Law		Lecture / 	Smeddinck

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Written exam with 120 min

Prerequisites

None

Annotation

None

T

6.34 Course: Environmentally-Friendly Recycling and Disassembly of Buildings [T-BGU-100146]





Responsible: Prof. Dr.-Ing. Sascha Gentes

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [M-BGU-100110 - Environmentally-friendly Recycling and Disassembly of Buildings](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	6	Grade to a third	Each term	1

Events					
ST 2024	6243801	Project Studies	2 SWS	Lecture / Practice (/)	Hauptenthal, Gentes
ST 2024	6243803	Dismantling Techniques	2 SWS	Lecture / Practice (/)	Gentes

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 30 min.

Prerequisites

none

Recommendation

none

Annotation

none

T



6.35 Course: Equipment and Special Construction Techniques in Building Practice [T-BGU-108009]





Responsible: Prof. Dr.-Ing. Sascha Gentes

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [M-BGU-103918 - Equipment and Special Construction Techniques in Building Practice](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	6	Grade to a third	Each term	1

Events					
WT 23/24	6243905	Geräte und spezielle Verfahren in der Baupraxis II	2 SWS	Lecture / 	Gentes, Schneider
ST 2024	6241815	Geräte und spezielle Verfahren in der Baupraxis I	2 SWS	Lecture / 	Gentes, Schneider

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 45 min.

Prerequisites

none

Recommendation

none

Annotation



none

T

6.36 Course: Examination Prerequisite Environmental Communication [T-BGU-106620]

Responsible: Dr. rer. nat. Charlotte Kämpf
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-101108 - Environmental Communication](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each summer term	1

Events					
WT 23/24	6224905	Umweltkommunikation / Environmental Communication	2 SWS	Seminar / 	Kämpf
ST 2024	6224905	Environmental Communication	2 SWS	Seminar / 	Kämpf

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

2 literature annotations, appr. 150 words each, and short presentation, appr. 10 min.

Prerequisites

none

Recommendation

none

Annotation


none





T

6.37 Course: Facility Management [T-BGU-111908]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-105922 - Facility Management](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	6	Grade to a third	Each term	1 terms	2

Events					
WT 23/24	6242908	Facility and Service Management	3 SWS	Lecture / Practice (/ )	Lennerts
WT 23/24	6242909	Facility and Real Estate Management II	1 SWS	Lecture / 	Lennerts

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 90 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.38 Course: Facility Management in Hospitals [T-BGU-108004]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-106454 - Facility Management in Hospitals](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	6	Grade to a third	Each winter term	2

Events					
WT 23/24	6242905	Facility Management in Hospitals	4 SWS	Lecture / Practice (/)	Lennerts, Mitarbeiter/ innen

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

term paper appr. 10 pages, with final presentation appr. 10 min.

Prerequisites

none

Recommendation

none

Annotation



none

T

6.39 Course: Foundations of Informatics I [T-WIWI-102749]

Responsible: Dr.-Ing. Michael Färber
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-106032 - Foundations of Informatics I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each summer term	2

Events					
ST 2024	2511010	Foundations of Informatics I	2 SWS	Lecture / 	Färber, Käfer
ST 2024	2511011	Exercises to Foundations of Informatics I		Practice / 	Färber, Popovic, Noullet, Käfer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of an 1h written exam according to Section 4 (2), 1 of the examination regulation.

The exam takes place every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites



None

T

6.40 Course: Foundations of Informatics II [T-WIWI-102707]

Responsible: Prof. Dr. Sanja Lazarova-Molnar
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-106033 - Foundations of Informatics II](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	1

Events					
WT 23/24	2511012	Foundations of Informatics II	3 SWS	Lecture / 	Lazarova-Molnar
WT 23/24	2511013	Tutorien zu Grundlagen der Informatik II	1 SWS	Tutorial (/ 	Lazarova-Molnar, Götz, Khodadadi

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written exam according to Section 4(2), 1 of the examination regulation. The examination takes place every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites

None

Recommendation

It is recommended to attend the course "Foundations of Informatics I" beforehand.



Active participation in the practical lessons is strongly recommended.





T

6.41 Course: Fundamentals of Production Management [T-WIWI-102606]

Responsible: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101437 - Industrial Production I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5,5	Grade to a third	Each summer term	1

Events					
ST 2024	2581950	Fundamentals of Production Management	2 SWS	Lecture / 	Schultmann
ST 2024	2581951	Übungen Grundlagen der Produktionswirtschaft	2 SWS	Practice / 	Braun

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written exam (90 minutes) (following §4(2) of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date. Depending on the respective pandemic situation, the exam may be offered as an open book exam (alternative exam assessment, following §4(2), 3 of the examination regulation).

Prerequisites

None

T

6.42 Course: History of Urban Planning [T-BGU-108441]

Responsible: Dr. rer. nat. Marion Hitzeroth
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100013 - Urban Renewal](#)

Type
Written examination

Credits
3

Grading scale
Grade to a third

Recurrence
Each term

Version
2

Events					
ST 2024	6328016	Urban Planning I: Urban Planning History	2 SWS	Lecture / 	Ross

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 90 min.

Prerequisites

none

Recommendation

none

Annotation

none


T





6.43 Course: Human Factors Engineering I [T-MACH-105518]

Responsible: Prof. Dr.-Ing. Barbara Deml
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-106031 - Human-oriented Production](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each winter term	2

Events					
WT 23/24	2109035	Human Factors Engineering I: Ergonomics	2 SWS	Lecture / 	Deml

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 60 minutes

The exams are only offered in German!

Prerequisites

none

T


6.44 Course: Human-oriented Productivity Management: Personnel Management [T-MACH-106374]





Responsible: Dr.-Ing. Patricia Stock

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-106031 - Human-oriented Production](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each winter term	1

Events					
WT 23/24	2109021	Human-oriented Productivity Management: Personnel Management	2 SWS	Block / 	Stock

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam (approx. 20 min)

The exam is offered in German only!

Prerequisites


Timely pre-registration in ILIAS, since participation is limited.





T

6.45 Course: Image Sequence Analysis [T-BGU-101167]

Responsible: Prof. Dr.-Ing. Stefan Hinz
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100674 - 2D/3D Image Analysis and Image Based Tracking Methods](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	3	Grade to a third	Each winter term	2

Events					
WT 23/24	6043103	Image Sequence Analysis, Lecture	2 SWS	Lecture / 	Meidow

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 20 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.46 Course: In-depth Module - Doing Culture - Self Assignment BAK [T-ZAK-112655]

Responsible: Dr. Christine Mielke
Christine Myglas

Organisation:

Part of: [M-ZAK-106235 - Supplementary Studies on Culture and Society](#)

Type	Credits	Grading scale	Version
Examination of another type	3	Grade to a third	1

Competence Certificate

At least two presentations must be given: An examination of another kind according to § 5 section 3 (3) in the form of a presentation in one of the chosen courses (3 ECT).

In a third seminar, either (a) a presentation is held (preliminary study achievement) which remains not graded and a topic-related term paper is submitted or (b) a written exam is taken.

The three courses can be selected individually from the 5 thematic blocks or – in exceptional cases and according to the agreement with the responsible lecturer – all three courses can be selected from one block in the sense of a specialization.

In addition, an oral examination is taken, which relates to the content of two of the chosen three courses.

Prerequisites

Prerequisite for the 'Oral Examination' is the successful completion of Modules 1 and 3 and the required elective sections in Module 2.

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- Zentrum für Angewandte Kulturwissenschaft und Studium Generale
- ZAK Begleitstudium

Annotation

The content of the Basic Modul is helpful.

T

6.47 Course: In-depth Module - Global Cultures - Self Assignment BAK [T-ZAK-112658]

Responsible: Dr. Christine Mielke
Christine Myglas

Organisation:

Part of: [M-ZAK-106235 - Supplementary Studies on Culture and Society](#)

Type	Credits	Grading scale	Version
Examination of another type	3	Grade to a third	1

Competence Certificate

At least two presentations must be given: An examination of another kind according to § 5 section 3 (3) in the form of a presentation in one of the chosen courses (3 ECT).

In a third seminar, either (a) a presentation is held (preliminary study achievement) which remains not graded and a topic-related term paper is submitted or (b) a written exam is taken.

The three courses can be selected individually from the 5 thematic blocks or – in exceptional cases and according to the agreement with the responsible lecturer – all three courses can be selected from one block in the sense of a specialization.

In addition, an oral examination is taken, which relates to the content of two of the chosen three courses.

Prerequisites

Prerequisite for the 'Oral Examination' is the successful completion of Modules 1 and 3 and the required elective sections in Module 2.

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- Zentrum für Angewandte Kulturwissenschaft und Studium Generale
- ZAK Begleitstudium

Annotation

The content of the Basic Modul is helpful.

T

6.48 Course: In-depth Module - Media & Aesthetics - Self Assignment BAK [T-ZAK-112656]

Responsible: Dr. Christine Mielke
Christine Myglas

Organisation:

Part of: [M-ZAK-106235 - Supplementary Studies on Culture and Society](#)

Type	Credits	Grading scale	Version
Examination of another type	3	Grade to a third	1

Competence Certificate

At least two presentations must be given: An examination of another kind according to § 5 section 3 (3) in the form of a presentation in one of the chosen courses (3 ECT).

In a third seminar, either (a) a presentation is held (preliminary study achievement) which remains not graded and a topic-related term paper is submitted or (b) a written exam is taken.

The three courses can be selected individually from the 5 thematic blocks or – in exceptional cases and according to the agreement with the responsible lecturer – all three courses can be selected from one block in the sense of a specialization.

In addition, an oral examination is taken, which relates to the content of two of the chosen three courses.

Prerequisites

Prerequisite for the 'Oral Examination' is the successful completion of Modules 1 and 3 and the required elective sections in Module 2.

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- Zentrum für Angewandte Kulturwissenschaft und Studium Generale
- ZAK Begleitstudium

Annotation

The content of the Basic Modul is helpful.

T

6.49 Course: In-depth Module - Spheres of Life - Self Assignment BAK [T-ZAK-112657]

Responsible: Dr. Christine Mielke
Christine Myglas

Organisation:

Part of: [M-ZAK-106235 - Supplementary Studies on Culture and Society](#)

Type	Credits	Grading scale	Version
Examination of another type	3	Grade to a third	1

Competence Certificate

At least two presentations must be given: An examination of another kind according to § 5 section 3 (3) in the form of a presentation in one of the chosen courses (3 ECT).

In a third seminar, either (a) a presentation is held (preliminary study achievement) which remains not graded and a topic-related term paper is submitted or (b) a written exam is taken.

The three courses can be selected individually from the 5 thematic blocks or – in exceptional cases and according to the agreement with the responsible lecturer – all three courses can be selected from one block in the sense of a specialization.

In addition, an oral examination is taken, which relates to the content of two of the chosen three courses.

Prerequisites

Prerequisite for the 'Oral Examination' is the successful completion of Modules 1 and 3 and the required elective sections in Module 2.

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- Zentrum für Angewandte Kulturwissenschaft und Studium Generale
- ZAK Begleitstudium

Annotation

The content of the Basic Modul is helpful.

T

6.50 Course: In-depth Module - Technology & Responsibility - Self Assignment BAK [T-ZAK-112654]

Responsible: Dr. Christine Mielke
Christine Myglas

Organisation:

Part of: [M-ZAK-106235 - Supplementary Studies on Culture and Society](#)

Type	Credits	Grading scale	Version
Examination of another type	3	Grade to a third	1

Competence Certificate

At least two presentations must be given: An examination of another kind according to § 5 section 3 (3) in the form of a presentation in one of the chosen courses (3 ECT).

In a third seminar, either (a) a presentation is held (preliminary study achievement) which remains not graded and a topic-related term paper is submitted or (b) a written exam is taken.

The three courses can be selected individually from the 5 thematic blocks or – in exceptional cases and according to the agreement with the responsible lecturer – all three courses can be selected from one block in the sense of a specialization.

In addition, an oral examination is taken, which relates to the content of two of the chosen three courses.

Prerequisites

Prerequisite for the 'Oral Examination' is the successful completion of Modules 1 and 3 and the required elective sections in Module 2.

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- Zentrum für Angewandte Kulturwissenschaft und Studium Generale
- ZAK Begleitstudium

Annotation

The content of the Basic Modul is helpful.

T

6.51 Course: Integrated Production Planning in the Age of Industry 4.0 [T-MACH-108849]





Responsible: Prof. Dr.-Ing. Gisela Lanza

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-105350 - Integrated Production Planning in the Age of Industry 4.0](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	8	Grade to a third	Each summer term	2

Events					
ST 2024	2150660	Integrated Production Planning in the Age of Industry 4.0	6 SWS	Lecture / Practice (/)	Lanza

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 40 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.52 Course: Introduction to GIS for Students of Natural, Engineering and Geo Sciences [T-BGU-101681]

Responsible: Dr.-Ing. Sven Wursthorn

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [M-BGU-101846 - Introduction to GIS for Students of Natural, Engineering and Geo Sciences](#)

Type
Written examination

Credits
3

Grading scale
Grade to a third

Recurrence
Each winter term

Version
4

Events					
WT 23/24	6071101	Einführung in GIS für Studierende natur-, ingenieur- und geowissenschaftlicher Fachrichtungen, V/Ü	4 SWS	Lecture / Practice (/)	Wursthorn

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

written exam, 90 min.

Prerequisites

'Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite' (T-BGU-103541) has to be passed

Modeled Conditions

The following conditions have to be fulfilled:

1. The course [T-BGU-103541 - Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite](#) must have been passed.

Recommendation

none

Annotation

none

T 6.53 Course: Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite [T-BGU-103541]

Responsible: Dr.-Ing. Sven Wursthorn
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-101846 - Introduction to GIS for Students of Natural, Engineering and Geo Sciences](#)

Type Completed coursework	Credits 3	Grading scale pass/fail	Recurrence Each winter term	Version 4
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Events					
WT 23/24	6071101	Einführung in GIS für Studierende natur-, ingenieur- und geowissenschaftlicher Fachrichtungen, V/Ü	4 SWS	Lecture / Practice (/ ●)	Wursthorn

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

The achievement control takes place via accepted exercises.

Prerequisites

none

Recommendation

none

Annotation


none

T

6.54 Course: Introduction to Matlab [T-BGU-106765]

Responsible: PD Dr.-Ing. Uwe Ehret
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-106122 - Interdisciplinary Qualifications](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	3	pass/fail	Each winter term	1

Events					
WT 23/24	6224907	Introduction to Matlab	2 SWS	Lecture / Practice (/ )	Ehret, Wienhöfer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Implementation of a Matlab code within a class exercise

Prerequisites

none

Recommendation

none

Annotation


The course is limited to 60 participants. Please register via the student portal (Studierendenportal). Only in case that this should not be possible: Please register via e-mail to the responsible lecturer. Participants are selected according to their progress of study considering the following order: students of Water Science and Engineering, then students of Civil Engineering with focus 'Water and Environment', then other students.





T

6.55 Course: Introduction to Programming with Java [T-WIWI-102735]

Responsible: Prof. Dr.-Ing. Johann Marius Zöllner
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101581 - Introduction to Programming](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	2

Events					
WT 23/24	2511000	Introduction to Programming with Java	3 SWS	Lecture / 	Zöllner
WT 23/24	2511002	Tutorien zu Programmieren I: Java	1 SWS	Tutorial (Zöllner, Stegmaier, Schneider, Mütsch, Polley
WT 23/24	2511003	Computer lab Introduction to Programming with Java	2 SWS		Zöllner, Stegmaier, Schneider, Mütsch, Polley

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written resp. computer-based exam (60 min) according to Section 4 (2),1 of the examination regulation.

The successful completion of the compulsory tests in the computer lab is prerequisites for admission to the written resp. computer-based exam.

The examination takes place every semester. Re-examinations are offered at every ordinary examination date.

Annotation

see german version

T


6.56 Course: Introduction to Python [T-BGU-112598]





Responsible: Prof. Dr. Jan Cermak
Dr. Julia Fuchs

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [M-BGU-106122 - Interdisciplinary Qualifications](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Completed coursework (practical)	3	pass/fail	Each winter term	1 terms	2

Events					
WT 23/24	6020130	Introduction to Python	2 SWS	Lecture / Practice (/ )	Cermak

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Successfully completed exercises focussing on implementation and documentation of a Python code.

Prerequisites

None

Recommendation

None

Annotation

The associated lecture is especially intended for students of the MSc Geodäsie und Geoinformatik and MSc Remote Sensing and Geoinformatics.

External students may attend the course if there is sufficient capacity. External students communicate their individual interest to participate in this lecture at the latest one week before the start of the lectures via e-mail to anja.carle@kit.edu receive positive/negative feedback regarding the possibility of participation.



T





6.57 Course: IoT Platform for Engineering [T-MACH-106743]

Responsible: Prof. Dr.-Ing. Jivka Ovtcharova
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-105961 - Virtual Engineering Construction - A](#)
[M-MACH-105992 - Virtual Engineering Construction - B](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each term	2

Events					
WT 23/24	2123352	IoT platform for engineering	3 SWS	Project (P / )	Ovtcharova, Maier
ST 2024	2123352	IoT platform for engineering	3 SWS	Project (P / )	Meyer, Maier

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

process implementation by means of an IT-system and hardware within a team, final presentation, appr. 30 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.58 Course: Landfills [T-BGU-100084]

Responsible: Dr.-Ing. Andreas Bieberstein
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100079 - Environmental Geotechnics](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	3	Grade to a third	Each winter term	1

Events					
WT 23/24	6251913	Landfills	2 SWS	Lecture / Practice (/)	Bieberstein

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

oral exam, appr. 20 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.59 Course: Leadership and Communication [T-BGU-111900]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-105917 - Leadership and Communication](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	6	Grade to a third	Each term	1 terms	1

Events					
ST 2024	6241805	Leadership and Communication	4 SWS	Lecture / Practice (/)	Haghsheno, Eschen

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 90 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.60 Course: Lean Construction [T-BGU-108000]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100104 - Lean Construction](#)

Type
Written examination

Credits
4,5

Grading scale
Grade to a third

Recurrence
Each term

Version
1

Events					
WT 23/24	6241901	Lean Construction	4 SWS	Lecture / Practice (/)	Haghsheno, Mitarbeiter/innen

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 70 min.

Prerequisites

none

Recommendation

none

Annotation

none





T

6.61 Course: Lean Integrated Project Delivery [T-BGU-111910]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-105925 - Lean Integrated Project Delivery \(Lean IPD\)](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	3	Grade to a third	Each term	1 terms	1

Events					
ST 2024	6241817	Lean Integrated Project Delivery	3 SWS	Lecture / 	Haghsheno

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 60 min.

Prerequisites

none

Recommendation

none

Annotation

none

T


6.62 Course: Life Cycle Assessment – Basics and Application Possibilities in an Industrial Context [T-WIWI-113107]





Responsible: Prof. Dr. Frank Schultmann

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-106036 - Environmental Emissions and Life Cycle Assessment](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each winter term	1

Events					
WT 23/24	2581995	Life Cycle Assessment - Basics and Application Possibilities in an Industrial Context	2 SWS	Lecture / 	Steffl, Tremel

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of an oral (30 minutes) or written exam (60 minutes) (following §4(2) of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date. Depending on the respective pandemic situation, the exam may be offered as an open book exam (alternative exam assessment, following §4(2), 3 of the examination regulation).

Prerequisites

None.

Recommendation


None

T

6.63 Course: Logistics and Supply Chain Management [T-WIWI-102870]

Responsible: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101437 - Industrial Production I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each summer term	2

Events					
ST 2024	2581996	Logistics and Supply Chain Management	2 SWS	Lecture / 	Schultmann, Rosenberg

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 60 min.

Prerequisites

none

Recommendation

none


Annotation





none

T

6.64 Course: Logistics and Supply Chain Management [T-MACH-110771]**Responsible:** Prof. Dr.-Ing. Kai Furmans**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-105298 - Logistics and Supply Chain Management](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	9	Grade to a third	Each summer term	4

Events					
ST 2024	2118078	Logistics and Supply Chain Management	4 SWS	Lecture / 	Furmans, Alicke

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

written exam, 120 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.65 Course: Machinery and Process Engineering [T-BGU-100623]

Responsible: Prof. Dr.-Ing. Sascha Gentes
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100339 - Machinery and Process Engineering](#)



Type
Written examination





Credits
5

Grading scale
Grade to a third

Recurrence
Each term

Version
2

Events					
WT 23/24	6241703	Verfahrenstechnik	2 SWS	Lecture / 	Schneider
WT 23/24	6243701	Maschinentechnik	2 SWS	Lecture / 	Gentes, Dörfler

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 90 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.66 Course: Master's Thesis [T-BGU-112486]

Responsible: Studiendekan:in der KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-106121 - Module Master's Thesis](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Final Thesis	30	Grade to a third	Each term	1 terms	1

Competence Certificate

duration appr. 6 months

presentation within one month after submission of the thesis

Prerequisites

defined for the module Master Thesis

Final Thesis

This course represents a final thesis. The following periods have been supplied:

Submission deadline 6 months**Maximum extension period** 3 months**Correction period** 8 weeks

This thesis requires confirmation by the examination office.

Recommendation

see module

Annotation

Information about the procedure regarding admission and registration of the Master Thesis see chap. 2.9.

T

6.67 Course: Models and Methods in Traffic Engineering and Transportation Planning [T-BGU-100012]





Responsible: Prof. Dr.-Ing. Peter Vortisch

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [M-BGU-100008 - Models and Methods in Traffic Engineering and Transportation Planning](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	6	Grade to a third	Each term	1

Events					
WT 23/24	6232701	Berechnungsverfahren und Modelle in der Verkehrsplanung	2 SWS	Lecture / Practice (/ )	Vortisch, Mitarbeiter/innen
WT 23/24	6232703	Straßenverkehrstechnik	2 SWS	Lecture / Practice (/ )	Vortisch, Mitarbeiter/innen

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 20 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.68 Course: Operations Research in Health Care Management [T-WIWI-102884]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-106046 - Digital Service Systems](#)

Type
Written examination



Credits
4,5

Grading scale
Grade to a third

Recurrence
Irregular

Version
2

Events					
ST 2024	2550495	Operations Research in Health Care Management	2 SWS	Lecture / 	Nickel, Graß
ST 2024	2550496	Übungen zu OR im Health Care Management	1 SWS	Practice / 	Bakker, Graß

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment is a 60 minutes written examination (according to §4(2), 1 of the examination regulation).

The examination is held in the term of the lecture and the following lecture.

Prerequisites

None

Recommendation

Basic knowledge as conveyed in the module "Introduction to Operations Research" is assumed.

Annotation

The course is offered irregularly. Planned lectures for the next three years can be found in the internet at <http://dol.ior.kit.edu/english/Courses.php>.

T

6.69 Course: Operations Research in Supply Chain Management [T-WIWI-102715]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-106046 - Digital Service Systems](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Irregular	2

Competence Certificate

The assessment is a 60 minutes written examination (according to §4(2), 1 of the examination regulation).

The examination is held in the term of the lecture and the following lecture.

Prerequisites

None

Recommendation

Basic knowledge as conveyed in the module Introduction to Operations Research and in the lectures Facility Location and Strategic SCM, Tactical and operational SCM is assumed.

Annotation

The course is offered irregularly. Planned lectures for the next three years can be found in the internet at <http://dol.ior.kit.edu/english/Courses.php>.

T

6.70 Course: Oral Exam - Supplementary Studies on Culture and Society [T-ZAK-112659]

Responsible: Dr. Christine Mielke
Christine Myglas

Organisation:

Part of: [M-ZAK-106235 - Supplementary Studies on Culture and Society](#)

Type	Credits	Grading scale	Version
Oral examination	4	Grade to a third	1

Competence Certificate

An oral examination according to § 7 section 6 of approx. 45 minutes on the contents of two courses from In-depth Module.

Prerequisites

Prerequisite for the 'Oral Examination' is the successful completion of Modules 1 and 3 and the required elective sections in Module 2.

T

6.71 Course: Oral Exam - Supplementary Studies on Sustainable Development [T-ZAK-112351]**Organisation:****Part of:** [M-ZAK-106099 - Supplementary Studies on Sustainable Development](#)

Type	Credits	Grading scale	Version
Oral examination	4	Grade to a third	1

Competence Certificate

An oral examination according to § 7 section 6 of approx. 45 minutes on the contents of two courses from Elective Module.

Prerequisites

A requirement for the Supplementary Course: Oral examination is the successful completion of the modules Basics Module and Specialisation Module and the required electives of Elective Module.

T

6.72 Course: PLM for Product Development in Mechatronics [T-MACH-102181]

Responsible: Prof. Dr.-Ing. Martin Eigner

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-105961 - Virtual Engineering Construction - A](#)
[M-MACH-105992 - Virtual Engineering Construction - B](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each summer term	2

Events					
WT 23/24	2122376	PLM for product development in mechatronics	2 SWS	Lecture / 	Eigner
ST 2024	2122376	PLM for product development in mechatronics	2 SWS	Lecture / 	Eigner

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 20 min.

Prerequisites

none

Recommendation

none

Annotation

none



T





6.73 Course: PLM-CAD Workshop [T-MACH-102153]

Responsible: Prof. Dr.-Ing. Jivka Ovtcharova
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-105961 - Virtual Engineering Construction - A](#)
[M-MACH-105992 - Virtual Engineering Construction - B](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each term	3

Events					
WT 23/24	2121357	PLM-CAD Workshop	4 SWS	Project (P / )	Ovtcharova, Mitarbeiter
ST 2024	2121357	PLM-CAD Workshop	4 SWS	Project (P / )	Meyer, Mitarbeiter

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

development and production of a proto type in a team

Prerequisites

none

Recommendation

none

Annotation


none





T

6.74 Course: Practical Fire Protection [T-BGU-100042]

Responsible: Thomas Egelhaaf
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100060 - Building Physics II](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	3	Grade to a third	Each term	1

Events					
ST 2024	6211815	Practical Fire Protection	2 SWS	Lecture / 	Egelhaaf

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 20 min.

Prerequisites

none

Recommendation

none

Annotation


none





T

6.75 Course: Practical Noise Control [T-BGU-108024]

Responsible: Christian Zander
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100060 - Building Physics II](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	3	Grade to a third	Each term	3

Events					
ST 2024	6211814	Practical Noise Control	2 SWS	Lecture / 	Zander

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 20 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.76 Course: Practice Module [T-ZAK-112660]

Responsible: Dr. Christine Mielke
Christine Myglas

Organisation:

Part of: [M-ZAK-106235 - Supplementary Studies on Culture and Society](#)

Type	Credits	Grading scale	Version
Completed coursework	4	pass/fail	1

Competence Certificate

Internship (3 ECT)

Report within the framework of the practical training (Length approx. 18,000 characters (incl. spaces)

(1 ECT)

Prerequisites

none

Annotation

Knowledge from the Basic Module and the Elective Module is helpful.

T

6.77 Course: Production Economics and Sustainability [T-WIWI-102820]





Responsible: Prof. Dr. Frank Schultmann
Dr.-Ing. Rebekka Volk

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-101437 - Industrial Production I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each winter term	1

Events					
WT 23/24	2581960	Production Economics and Sustainability	2 SWS	Lecture / 	Volk

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 60 min.

Prerequisites

none

Recommendation

none

Annotation



none





T

6.78 Course: Production Planning and Control in Construction [T-BGU-111901]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-105918 - Production Planning and Control in Construction](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	5	Grade to a third	Each term	1 terms	1

Events					
ST 2024	6241801	Site Management	1 SWS	Lecture / Practice (/ )	N.N.
ST 2024	6241803	Site Planning and Handling	3 SWS	Lecture / Practice (/ )	Miernik, Kohlhammer, Haghsheno, Mitarbeiter/innen

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 90 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.79 Course: Productivity Management in Production Systems [T-MACH-105523]**Responsible:** Prof. Dr.-Ing. Sascha Stowasser**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-106031 - Human-oriented Production](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each summer term	1

Events					
ST 2024	2110046	Productivity Management in Production Systems	2 SWS	/ ●	Stowasser

Legend: 📺 Online, 🔄 Blended (On-Site/Online), ● On-Site, ✕ Cancelled

Competence Certificate

oral exam (approx. 30 min)

The exam is offered in German only!

Prerequisites

none





T

6.80 Course: Project Lean Integrated Project Delivery [T-BGU-111911]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-105925 - Lean Integrated Project Delivery \(Lean IPD\)](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	3	Grade to a third	Each summer term	1 terms	1

Events					
ST 2024	6241817	Lean Integrated Project Delivery	3 SWS	Lecture / 	Haghsheno

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

case study report, appr. 15 pages;
 final presentation and colloquium, appr. 30 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.81 Course: Project Management in Construction and Real Estate Industry [T-BGU-100622]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [M-BGU-100338 - Project Management in Construction and Real Estate Industry](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	5	Grade to a third	Each term	4

Events					
WT 23/24	6241701	Projektmanagement in der Bau- und Immobilienwirtschaft	4 SWS	Lecture / Practice (/)	Haghsheno, Mitarbeiter/innen

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

case study during the semester:

report appr. 15 pages

interim presentations and final presentations appr. 10 min. each

colloquium at the end of the semester appr. 10 min.

Prerequisites

none

Recommendation

none

Annotation


none

T

6.82 Course: Project Paper Lean Construction [T-BGU-101007]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100104 - Lean Construction](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	1,5	Grade to a third	Each winter term	1

Events					
WT 23/24	6241901	Lean Construction	4 SWS	Lecture / Practice (/ )	Haghsheno, Mitarbeiter/innen

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

project:

report, appr. 10 pages, and
 presentation, appr. 10 min.

Prerequisites

none

Recommendation

none

Annotation



none

T

6.83 Course: Public Law I & II [T-INFO-110300]

Responsible: N.N.
Organisation: KIT Department of Informatics
Part of: [M-INFO-101192 - Constitutional and Administrative Law](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each summer term	1

Events					
WT 23/24	24016	Öffentliches Recht I - Grundlagen	2 SWS	Lecture / 	Zufall
ST 2024	24520	Öffentliches Recht II - Öffentliches Wirtschaftsrecht	2 SWS	Lecture / 	Zufall

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled


T

6.84 Course: Quality Management [T-MACH-102107]

Responsible: Prof. Dr.-Ing. Gisela Lanza
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-105332 - Quality Management](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each winter term	3

Events					
WT 23/24	2149667	Quality Management	2 SWS	Lecture / 	Lanza

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 60 min

Prerequisites

It is not possible to combine this brick with brick [Quality Management \[T-MACH-112586\]](#).

Recommendation

none

Annotation


none





T

6.85 Course: Quarter Analysis [T-ARCH-107375]

Responsible: Prof. Markus Nepl
Organisation: KIT Department of Architecture
Part of: [M-ARCH-103633 - Quarter Analysis](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each winter term	1

Events					
WT 23/24	1731095	Quarter Analysis: The Ephemeral City - Planning Principles of Temporary Urban Structures	2 SWS	Seminar / 	Nepl, Giralt

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Other examination requirements consisting of an oral presentation of the work results (duration approx. 15 minutes).

Prerequisites

none

T

6.86 Course: Real Estate and Facility Management - on Site Lectures [T-BGU-111909]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [M-BGU-105924 - Real Estate and Facility Management - on Site Lectures](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	6	Grade to a third	Each summer term	1 terms	1

Events					
ST 2024	6242804	Real Estate und Facility Management – on site lectures	4 SWS	Lecture / Practice (/)	Lennerts

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

report appr. 15 pages and presentatin/colloquium appr. 15 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.87 Course: Real Estate Management [T-BGU-100629]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100346 - Real Estate Management](#)





Type
Written examination





Credits
6

Grading scale
Grade to a third

Recurrence
Each term

Version
2

Events					
WT 23/24	6242901	Real Estate Management Controlling	1 SWS	Lecture / 	Lennerts
WT 23/24	6242902	Property Valuation Basics	1 SWS	Lecture / 	Lennerts
WT 23/24	6242903	Corporate and Public Real Estate Management	1 SWS	Lecture / 	Lennerts
WT 23/24	6242904	Projectdevelopment with Case Study	1 SWS	Lecture / 	Lennerts, Mitarbeiter/ innen

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 90 min.

Prerequisites

none

Recommendation

none

Annotation



none





T

6.88 Course: Research Seminar Construction Management [T-BGU-108008]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-103917 - Research Seminar Construction Management](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	6	Grade to a third	Each term	1

Events					
WT 23/24	6241906	Baubetriebliches Forschungsseminar II	2 SWS	Seminar / 	Haghsheno, Mitarbeiter/innen
ST 2024	6241814	Baubetriebliches Forschungsseminar I	2 SWS	Seminar / 	Haghsheno, Mitarbeiter/innen

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

project report, appr. 25 pages, and colloquium, appr. 30 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.89 Course: Self Assignment HoC-ZAK-SpZ 1 not graded [T-BGU-112487]**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-106122 - Interdisciplinary Qualifications](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Completed coursework	2	pass/fail	Each term	1 terms	1

Competence Certificate

according to the assignment to be credited

Prerequisites

none

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- House of Competence
- Sprachenzentrum
- Zentrum für Angewandte Kulturwissenschaft und Studium Generale

Recommendation

none

Annotation

'Not assigned grades' can be assigned by the students themselves; titel and CP of the grades are taken over

T

6.90 Course: Self Assignment HoC-ZAK-SpZ 2 not graded [T-BGU-112488]**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-106122 - Interdisciplinary Qualifications](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Completed coursework	2	pass/fail	Each term	1 terms	1

Competence Certificate

according to the assignment to be credited

Prerequisites

none

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- House of Competence
- Sprachenzentrum
- Zentrum für Angewandte Kulturwissenschaft und Studium Generale

Recommendation

none

Annotation

'Not assigned grades' can be assigned by the students themselves; titel and CP of the grades are taken over

T

6.91 Course: Self Assignment HoC-ZAK-SpZ 3 not graded [T-BGU-112489]**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-106122 - Interdisciplinary Qualifications](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Completed coursework	2	pass/fail	Each term	1 terms	1

Competence Certificate

according to the assignment to be credited

Prerequisites

none

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- House of Competence
- Sprachenzentrum
- Zentrum für Angewandte Kulturwissenschaft und Studium Generale

Recommendation

none

Annotation

'Not assigned grades' can be assigned by the students themselves; titel and CP of the grades are taken over

T

6.92 Course: Self Assignment HoC-ZAK-SpZ 4 graded [T-BGU-112490]**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-106122 - Interdisciplinary Qualifications](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	2	Grade to a third	Each term	1 terms	1

Competence Certificate

according to the assignment to be credited

Prerequisites

none

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- House of Competence
- Sprachenzentrum
- Zentrum für Angewandte Kulturwissenschaft und Studium Generale

Recommendation

none

Annotation

'Not assigned grades' can be assigned by the students themselves; titel and CP of the grades are taken over

T

6.93 Course: Self Assignment HoC-ZAK-SpZ 5 graded [T-BGU-112491]**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-106122 - Interdisciplinary Qualifications](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	2	Grade to a third	Each term	1 terms	1

Competence Certificate

according to the assignment to be credited

Prerequisites

none

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- House of Competence
- Sprachenzentrum
- Zentrum für Angewandte Kulturwissenschaft und Studium Generale

Recommendation

none

Annotation

'Not assigned grades' can be assigned by the students themselves; titel and CP of the grades are taken over

T

6.94 Course: Self Assignment HoC-ZAK-SpZ 6 graded [T-BGU-112492]**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-106122 - Interdisciplinary Qualifications](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	2	Grade to a third	Each term	1 terms	1

Competence Certificate

according to the assignment to be credited

Prerequisites

none

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- House of Competence
- Sprachenzentrum
- Zentrum für Angewandte Kulturwissenschaft und Studium Generale

Recommendation

none

Annotation

'Not assigned grades' can be assigned by the students themselves; titel and CP of the grades are taken over

T

6.95 Course: Self Assignment HoC-ZAK-SpZ 7 not graded [T-BGU-112839]**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-106122 - Interdisciplinary Qualifications](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Completed coursework	2	pass/fail	Each term	1 terms	1

Competence Certificate

according to the assignment to be credited

Prerequisites

none

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- House of Competence
- Sprachenzentrum
- Zentrum für Angewandte Kulturwissenschaft und Studium Generale

Recommendation

none

Annotation


'Not assigned grades' can be assigned by the students themselves; titel and CP of the grades are taken over





T

6.96 Course: Seminar Construction Machinery [T-BGU-111907]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-105921 - Seminar Construction Machinery](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	6	Grade to a third	Each summer term	1 terms	1

Events					
ST 2024	6241816	Seminar Construction Machinery	4 SWS	Seminar / 	Schneider

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

portfolio:

report appr. 15 pages

presentation appr. 30 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.97 Course: Service Innovation [T-WIWI-102641]

Responsible: Prof. Dr. Gerhard Satzger
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-106046 - Digital Service Systems](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	2

Events					
ST 2024	2595468	Digital Services: Innovation & Business Models	1.5 SWS	Lecture / 	Satzger, Benz, Schüritz, Heinz

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Note: From summer semester 2023, the course Service Innovation will be offered with a revised course concept and content. The focus will be on the closer integration of the topics of service innovation and digitalization. Current foundational content (e.g., on service innovation challenges or human-centered innovation methods) will remain. New content will cover topics such as digital platforms and ecosystems, IoT and smart service innovation, and business models.

The assessment consists of a written exam (60 min.). A bonus can be acquired through successful participation in the exercise. If the grade of the written exam is between 4.0 and 1.3, the bonus improves the grade by one grade (0.3 or 0.4). Details will be announced in the lecture.

Prerequisites

None

Recommendation

None

Annotation

Starting with the summer semester 2023, the course Service Innovation will be called "Digital Services: Innovation & Business Models".

T

6.98 Course: Specialisation Module - Self Assignment BeNe [T-ZAK-112346]**Responsible:** Christine Myglas**Organisation:****Part of:** [M-ZAK-106099 - Supplementary Studies on Sustainable Development](#)

Type	Credits	Grading scale	Version
Examination of another type	6	Grade to a third	1

Competence Certificate

The monitoring occurs in the form of several supplementary courses, which usually comprise a presentation of the (group) project, a written elaboration of the (group) project as well as an individual term paper, if necessary with appendices (examination performances of other kind according to statutes § 5 section 3 No. 3 or § 7 section 7).

The presentation is usually with the accompanying practice partners, as well as the written paper.

Prerequisites

Active participation in all three mandatory components.

Self service assignment of supplementary studies

This course can be used for self service assignment of grade acquired from the following study providers:

- Zentrum für Angewandte Kulturwissenschaft und Studium Generale
- ZAK Begleitstudium




Recommendation





Knowledge from 'Basic Module ' and 'Elective Module ' is helpful.

T

6.99 Course: Student Research Project 'Building Preservation of Concrete and Masonry Constructions' [T-BGU-100175]**Responsible:** Dr.-Ing. Michael Vogel**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100058 - Building Preservation of Concrete and Masonry Constructions](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	1	pass/fail	Each summer term	2

Events					
ST 2024	6211811	Protection, Rehabilitation and Reinforcement of Concrete and Masonry Constructions	2 SWS	Lecture / 	Vogel
ST 2024	6211812	Exercises to Protection, Rehabilitation and Reinforcement of Concrete and Masonry Constructions	1 SWS	Practice / 	Vogel
ST 2024	6211813	Building Analysis	1 SWS	Lecture / 	Vogel

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

student research paper, 15-20 pages

Prerequisites

none

Recommendation

none

Annotation

none

T 6.100 Course: Student Research Project 'Cost Estimation in Structural Engineering and Earthworks' [T-BGU-108010]

Responsible: Dr.-Ing. Harald Schneider
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-105918 - Production Planning and Control in Construction](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	1	pass/fail	Each summer term	2

Events					
ST 2024	6241801	Site Management	1 SWS	Lecture / Practice (/)	N.N.

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate
 term paper, appr. 15 pages, with test

Prerequisites
 none

Recommendation
 none



Annotation
 none





T

6.101 Course: Student Research Project 'Excavation Pit Development and Shuttering Planning' [T-BGU-108012]

Responsible: Dr.-Ing. Harald Schneider
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100339 - Machinery and Process Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	1	pass/fail	Each winter term	2

Events					
WT 23/24	6241703	Verfahrenstechnik	2 SWS	Lecture / 	Schneider
WT 23/24	6243701	Maschinentechnik	2 SWS	Lecture / 	Gentes, Dörfler

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

term paper, appr. 15 pages, with test

Prerequisites

none

Recommendation

none

Annotation

none

T

6.102 Course: Student Research Project 'Scheduling and Building Site Facilities' [T-BGU-108011]





Responsible: Dr.-Ing. Harald Schneider

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [M-BGU-100338 - Project Management in Construction and Real Estate Industry](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	1	pass/fail	Each winter term	2

Events					
WT 23/24	6241701	Projektmanagement in der Bau- und Immobilienwirtschaft	4 SWS	Lecture / Practice (/)	Haghsheno, Mitarbeiter/innen

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

term paper, appr. 15 pages, with test

Prerequisites

none

Recommendation

none

Annotation

none

T

6.103 Course: Sustainability in Real Estate Management [T-BGU-100149]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100112 - Sustainability in Real Estate Management](#)



Type
Written examination





Credits
6

Grading scale
Grade to a third

Recurrence
Each term

Version
1

Events					
ST 2024	6242801	Sustainability in Real Estate Management	3 SWS	Lecture / Practice (/ )	Lennerts
ST 2024	6242803	Life Cycle Management of Real Estate	1 SWS	Lecture / 	Lennerts

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 90 min.

Prerequisites

none

Recommendation

none

Annotation

none

T


6.104 Course: Technical Energy Systems for Buildings 1: Processes & Components [T-MACH-105559]





Responsible: Dr. Ferdinand Schmidt

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-106179 - Technical Energy Systems for Buildings](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each winter term	1

Events					
WT 23/24	2157200	Technical energy systems for buildings 1: Processes & components	2 SWS	Lecture / 	Schmidt

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, approx. 30 minutes

Prerequisites





none

T

6.105 Course: Technical Energy Systems for Buildings 2: System Concept [T-MACH-105560]**Responsible:** Dr. Ferdinand Schmidt**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-106179 - Technical Energy Systems for Buildings](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each summer term	1

Events					
ST 2024	2158201	Technical energy systems for buildings 2: System concepts	2 SWS	Lecture / 	Schmidt

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

oral exam, approx. 30 minutes

Prerequisites

none

T



6.106 Course: Technology and Production Methods in Turnkey Construction and Civil Engineering Works [T-BGU-111899]





Responsible: Prof. Dr.-Ing. Shervin Haghsheno

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [M-BGU-105913 - Technology and Production Methods in Turnkey Construction and Civil Engineering Works](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	6	Grade to a third	Each term	1 terms	1

Events					
ST 2024	6241808	Turnkey Construction	2 SWS	Lecture / Practice (/ )	Teizer
ST 2024	6241810	Civil Engineering Structures and Regenerative Energies	2 SWS	Lecture / Practice (/ )	Haghsheno, Mitarbeiter/innen

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 90 min.

Prerequisites

none

Recommendation

none

Annotation

none

T



6.107 Course: Term Paper Upgrading of Existing Buildings and Energetic Refurbishment [T-BGU-100621]





Responsible: Prof. Dr.-Ing. Kunibert Lennerts

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [M-BGU-100108 - Upgrading of Existing Buildings and Energetic Refurbishment](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	1,5	Grade to a third	Each winter term	1

Events					
WT 23/24	6240901	Bauen im Bestand	3 SWS	Lecture / Practice (/ )	Lennerts, Schneider
WT 23/24	6240903	Energetische Sanierung	1 SWS	Lecture / 	Kropp, Münzl, Schneider

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

term paper, appr. 10 pages, and presentation, appr. 10 min.

Prerequisites

none

Recommendation

none

Annotation



none





T

6.108 Course: Traffic Management und Simulation Methods [T-BGU-100008]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100015 - Traffic Management und Simulation Methods](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	6	Grade to a third	Each term	1

Events					
ST 2024	6232802	Traffic Management and Telematics	2 SWS	Lecture / Practice (/ )	Vortisch
ST 2024	6232804	Traffic Simulation	2 SWS	Lecture / Practice (/ )	Vortisch, Mitarbeiter/innen

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, appr. 20 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.109 Course: Upgrading of Existing Buildings and Energetic Refurbishment [T-BGU-108001]

Responsible: Prof. Dr.-Ing. Kunibert Lennerts

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: [M-BGU-100108 - Upgrading of Existing Buildings and Energetic Refurbishment](#)



Type
Written examination





Credits
4,5

Grading scale
Grade to a third

Recurrence
Each term

Version
1

Events					
WT 23/24	6240901	Bauen im Bestand	3 SWS	Lecture / Practice (/ 	Lennerts, Schneider
WT 23/24	6240903	Energetische Sanierung	1 SWS	Lecture / 	Kropp, Münzl, Schneider

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 70 min.

Prerequisites

none

Recommendation

none

Annotation

none

T

6.110 Course: Urban Management [T-BGU-108442]

Responsible: Prof. Dr. Anke Karmann-Woessner
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: [M-BGU-100013 - Urban Renewal](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	3	Grade to a third	Each term	1

Competence Certificate

oral exam, appr. 15 min.

Prerequisites

none

Recommendation

none

Annotation**Please note:**


The course Urban Management (6231801), 2 HpW/SWS, will exceptionally not be offered in the summer semester 2024 but in the winter semester 2024/25.





T

6.111 Course: Urban Typologies [T-ARCH-107374]

Responsible: Prof. Markus Neppi
Organisation: KIT Department of Architecture
Part of: [M-ARCH-103632 - Urban Typologies](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each summer term	1

Events					
ST 2024	1731097	Urban Typologies: Architecture Journalism Workshop: We Write About Architecture	4 SWS	Seminar / 	Coenen

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Other examination requirements consisting of an oral presentation of the work results (duration approx. 15 minutes).

Prerequisites

none



T





6.112 Course: Virtual Engineering I [T-MACH-102123]

Responsible: Prof. Dr.-Ing. Jivka Ovtcharova
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-105961 - Virtual Engineering Construction - A](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each winter term	3

Events					
WT 23/24	2121352	Virtual Engineering I	2 SWS	Lecture / 	Ovtcharova
WT 23/24	2121353	Exercises Virtual Engineering I	2 SWS	Practice / 	Ovtcharova, Mitarbeiter

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 90 min.

Prerequisites

none

Recommendation

none

Annotation

none

T





6.113 Course: Virtual Engineering II [T-MACH-102124]

Responsible: Prof. Dr.-Ing. Jivka Ovtcharova
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-105992 - Virtual Engineering Construction - B](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each summer term	3

Events					
ST 2024	2122378	Virtual Engineering II	2/1 SWS	Lecture / Practice (/)	Häfner, Ovtcharova

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam, 90 min.

Prerequisites

none

Recommendation

none

Annotation

none



T





6.114 Course: Virtual Engineering Lab [T-MACH-106740]

Responsible: Prof. Dr.-Ing. Jivka Ovtcharova
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-105961 - Virtual Engineering Construction - A](#)
[M-MACH-105992 - Virtual Engineering Construction - B](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each term	1

Events					
WT 23/24	2123350	Virtual Engineering Lab	3 SWS	Project (P / )	Ovtcharova, Häfner
ST 2024	2123350	Virtual Engineering Lab	3 SWS	Project (P / )	Häfner, Ovtcharova

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

preparation of an VR application in a team

Prerequisites

none

Recommendation

none

Annotation

none

T

6.115 Course: Virtual Training Factory 4.X [T-MACH-106741]

Responsible: Prof. Dr.-Ing. Jivka Ovtcharova
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-105961 - Virtual Engineering Construction - A](#)
[M-MACH-105992 - Virtual Engineering Construction - B](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each term	2

Events					
WT 23/24	2123351	Virtual training factory 4.X		/ ●	Ovtcharova, Mitarbeiter

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

development of a product in a virtual environment in a team,
 preparation of a product video, appr. 5 min., in a team,
 preparation of a report, appr. 5 pages

Prerequisites

none

Recommendation

none

Annotation

none