Karlsruher Institut für Technologie

Module Handbook

Civil Engineering
(Bachelor of Science (B.Sc.), ER/SPO 2017)

Summer term 2024

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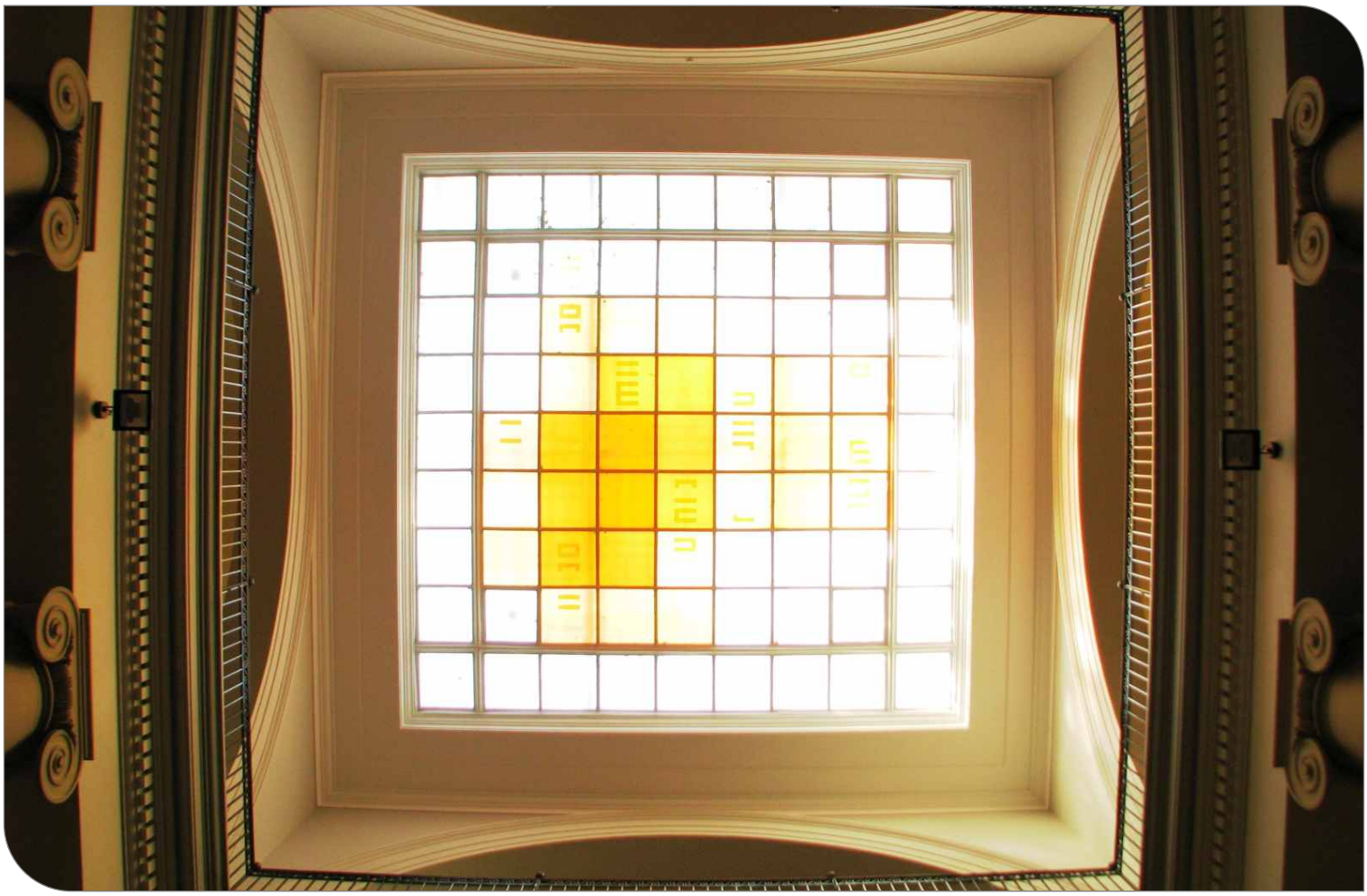
KIT DEPARTMENT OF CIVIL ENGINEERING, GEO- AND ENVIRONMENTAL SCIENCES



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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 (s. https://www.sle.kit.edu/english/vorstudium/bachelor-civil-engineering.php; *in German*) and program structure are specified by the curriculum (Chapt. 2). The main function of the Module Handbook is the compilation of the module descriptions (Chapt. 5) and the learning controls (Chapt. 6).

In addition to the module handbook, information on the individual courses (form, content, language, etc.) is in the online course catalog. For links to the courses (online) see the learning controls (Chapt. 6). The course language of all courses is German. Information about 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) and their amendment statutes, also available online:

https://www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2017_AB_010.pdf
(2017 KIT 010 Studien- und Prüfungsordnung des Karlsruher Instituts für Technologie (KIT) für den Bachelorstudiengang Bauingenieurwesen; *in German*)
https://www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2020_AB_049.pdf
(2020 KIT 049 Satzung des Karlsruher Instituts für Technologie (KIT) über die Änderung der Studien- und Prüfungsordnungen zur Anwendbarkeit der Satzung des Karlsruher Instituts für Technologie (KIT) zur Durchführung von Erfolgskontrollen im Antwort-Wahl-V., Artikel 3; *in German*)
https://www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2022_AB_005.pdf
(2022 KIT 005 Zweite Satzung zur Änderung der Studien- und Prüfungsordnung des Karlsruher Instituts für Technologie (KIT) für den Bachelorstudiengang Bauingenieurwesen; *in German*)
https://www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2022_AB_016.pdf
(2022 KIT 016 Satzung des Karlsruher Instituts für Technologie (KIT) zur Änderung der Regelungen über den Nachteilsausgleich in den Studien- und Prüfungsordnungen gemäß § 32 Abs. 4 Nr. 5 LHG in der Fassung des 4. Hochschuländerungsgesetzes (HRÄG), Artikel 3; *in German*)
https://www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2022_AB_037.pdf
(2022 KIT 037 Satzung des Karlsruher Instituts für Technologie (KIT) über die Änderung der Studien- und Prüfungsordnungen zur Anwendbarkeit der Satzung zur Durchführung von Online-Prüfungen am Karlsruher Institut für Technologie (KIT), Artikel 3; *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 3; *in German*)

Here, the structure of the degree program is presented and explained, for instance the assignment of the modules to the individual subjects is specified.

2.1 Objectives of the bachelor degree program

The bachelor degree program **Civil Engineering** provides a fundamental and research-oriented qualification in all professional fields of civil engineering and simultaneously the scientific qualification for starting a master degree program in civil engineering or a related field. The focus of the qualification is on the technical and scientific basics and methods in all fields of civil engineering. Further essential parts of the qualification are competences in teamwork and communication.

The graduates are able to extend their acquired basic knowledge and their methodological competences in engineering and natural sciences by targeted and effective inquiries and to apply them in line with demand. Thus, they can extend into any field of the civil engineering profession. With this, they are able to plan, design, construct, manage and maintain all kinds of buildings, facilities and infrastructure our society needs.

The graduates become acquainted with technical problems mostly by themselves. They think holistically and bring social, ecological and economic issues together to generate solutions. Their strength is on their technical know-how, which is supplemented by their acquired team and communication skills.

2.2 Structure of the bachelor degree program

The bachelor degree program Civil Engineering comprises 180 credit points (CP) and is structured in the two phases **Basic Studies** and **Basic Subject Studies** (see overview p. 6, comp. ER/SPO § 3 par. 3). These are subdivided into **subjects**, **modules** and **courses**.

All subjects in the Basic Studies as well as in the Basic Subject Studies are **compulsory subjects**. Respective modules are assigned with every subject (e.g. Mathematics or Mechanics). The extent of a module is described by credit points, which are credited after successfully passing a module. Descriptions of all modules are included in this module handbook.

Every module has one or more interrelated courses. Every module must be completed by one or more **learning controls**. Learning controls are either graded (examinations) or not graded (not graded accomplishments).

The components of the Basic Studies and Basic Subject Studies are explained below. Further learning controls can be taken in the Additional Studies. The tables (overview p. 7 - 9) show the order of the modules and the associated examinations. In the appendix, an exemplary curriculum illustrates one way to complete the studies within the standard study period. The selected courses and learning controls in the modules 'Basics in Engineering II' and 'Supplements in Engineering' are not any recommendation.

1. Sem. (WS)	2. Sem. (SS)	3. Sem. (WS)	4. Sem. (SS)	5. Sem. (WS)	6. Sem. (SS)

Basic Studies

Technical Compulsory Subjects

modules in subject Mechanics: 28 CP
Statics of Rigid Bodies
Strength of Materials
Dynamics
Hydromechanics

modules in subject Mathematics: 25 CP
Analysis and Linear Algebra
Integration and Multivariate Analysis
Applied Statistics
Differential Equations

modules in subject Building Materials and Building Constructions: 21 CP
Building Materials
Building Constructions

modules in subject Basics in Engineering: 10 CP
Basics in Engineering I
Basics in Engineering II (selection)

Basic Subject Studies

Technical Compulsory Subjects

module in subject Structural Analysis: 10 CP
Structural Analysis

module in subject Mobility and Infrastructure: 12 CP
Mobility and Infrastructure

modules in subject Structural Engineering: 14 CP
Basics of Reinforced Concrete
Basics in Steel and Timber Structures

module in subject Technology and Management in Construction Operation: 11 CP
Technology and Management in Construction Operation

module in subject Water and Environment: 12 CP
Water and Environment

module in subject Geotechnical Engineering: 11 CP
Geotechnical Engineering

module in subject Supplements in Engineering: 8 CP
Supplements in Engineering (selection)

Interdisciplinary Qualifications

Interdisciplinary Qualifications 6 CP
(selected from the offer of HoC, ZAK, SpZ)

Bachelor Thesis

12 CP
duration of preparation: 3 months
completion by presentation

Additional Studies

Additional Accomplishments / Additional Modules: max. 30 CP
freely selectable out of the entire course offer of KIT

prior master's transfer account: max. 30 CP
modules from a consecutive master degree program

Legend:

WS: winter semester
SS: summer semester
CP: credit points

Basic Studies

The **Basic Studies** define the semesters 1 - 3 of the standard period of study (comp. ER/SPO § 20). It covers 90 CP in total, 84 CP of them in the technical compulsory subjects. **Technical compulsory subjects** in the Basic Studies are the subjects Mechanics (28 CP, 4 modules), Mathematics (25 CP, 4 modules), Building Materials and Building Constructions (21 CP, 2 modules), as well as Basics in Engineering (10 CP, 2 modules). All modules are well defined with the associated learning controls in the subjects Mechanics, Mathematics as well as Building Materials and Building Constructions. All learning controls in these subjects are graded.

Subject	Module [Code (baui)]	Course	Type	1. semester			2. semester			3. semester		
				HpW	LC	CP	HpW	LC	CP	HpW	LC	CP
Mechanics	Statics of Rigid Bodies [BGP01]	Statics of Rigid Bodies	L/E	3/2	**wE OE**	7						
	Strength of Materials [BGP02]	Strength of Materials	L/E				4/2	**wE**	9			
	Dynamics [BGP03]	Dynamics	L/E							2/2	ngA [1] **wE**	6
	Hydromechanics [BGP04]	Hydromechanics	L/E							2/2	ngA [1] **wE**	6
Mathematics	Analysis and Linear Algebra [BGP05]	Analysis and Linear Algebra	L/E	4/2	**wE**	9						
	Integration and Multivariate Analysis [BGP06]	Integration and Multivariate Analysis	L/E				4/2	**wE**	9			
	Applied Statistics [BGP07]	Applied Statistics	L/E				2	**wE**	3			
	Differential Equations [BGP08]	Differential Equations	L/E							2/1	**wE**	4
Building Materials and Building Constructions	Building Materials [BGP09]	Theory of Building Materials	L/E				1/1	**wE OE**	3			
		Building Materials	L/E							4/2	**wE**	9
	Building Constructions [BGP10]	Building Physics	L/E				1/1	**wE OE**	3			
		Building Construction	L/E							2/2	**wE**	6
Basics in Engineering	Basics in Engineering I [BGP15]	Project Management	L/E	2	ngA	2						
		Geology in Civil Engineering	L/E				2	ngA	2			
		Introduction to Computer Programming I	L/E	1/1	ngA [1] ngA	2						
	Basics in Engineering II [BGW8]	selection (4 CP have to be taken)		2-4	ngA	2-4	0-2	ngA	0-2			
Interdisciplinary Qualifications	Interdisciplinary Qualifications [BUEQ]	selection from the offer of HoC, ZAK and SpZ		2	ngA	3	2	ngA	3			
Total				19-21	2E + 5-6nA	25-27	22-24	5E + 2-3nA	32-34	21	5E + 2nA	31

In the subject Basics in Engineering, the components of the module Basics in Engineering I (6 CP) are well defined as well, the associated learning controls are not graded. Whereas, the components of the module Basics in Engineering II (4 CP) can be selected from the available offer (see below). The associated learning controls are also not graded.

Subject	Module [Code (baui)]	Course	Type	1. semester			2. semester			3. semester		
				HpW	LC	CP	HpW	LC	CP	HpW	LC	CP
Basics in Engineering	Basics in Engineering II [BGW8]	Planning Methodology	L/E	2	ngA	2						
		Chemistry of Building Materials	L	2	ngA	2						
		Environmental Physics / Energy	L	2	ngA	2						
		Laboratory Course	P	2	ngA	2						
		Surveying	L/E				1/1	ngA	2			

The **Orientation Examinations** are the module examinations Statics of Rigid Bodies (subject Mechanics) as well as the partial examinations Theory of Building Materials and Building Physics (both subject Building Materials and Building Constructions). These have to be taken until the end of the second semester and to be passed until the end of the third semester.

Additionally, in the Basic Studies 6 CP have to be credited obligatorily as **Interdisciplinary Qualifications**. For that, courses can be freely selected in extent of 6 CP in total basically from the course catalog on key competences offered by the House of Competence (HoC) or the Centre for Cultural and General Studies (ZAK) or language courses of the 'Sprachenzentrum' (SpZ, center of language studies). Interdisciplinary qualifications acquired during a voluntarily taken professional internship can also be credited with CPs by a respective attestation.

Basic Subject Studies

The **Basic Subject Studies** define the semesters 4 - 6 of the standard period of study (comp. ER/SPO § 20). They cover 90 CP in total, 78 CP of them in the technical compulsory subjects. **Technical compulsory subjects** in the Basic Subject Studies are the subjects Structural Analysis (10 CP), Structural Engineering (14 CP), Water and Environment (12 CP), Mobility and Infrastructure (12 CP), Technology and Management in Construction (11 CP), Geotechnical Engineering (11 CP) as well as Supplements in Engineering (8 CP). These subjects consist of identically named modules, apart from the module Structural Engineering, which consists of the two modules Basics of Reinforced Concrete and Basics in Steel and Timber Structures. All learning controls in these modules are well defined and graded with exception of the module Supplements in Engineering.

				4. semester			5. semester			6. semester		
Subject	**Module [Code (baui)]**	**Course**	**Type**	**HpW**	**LC**	**CP**	**HpW**	**LC**	**CP**	**HpW**	**LC**	**CP**
Structural Analysis	Structural Analysis [BFP1]	Structural Analysis I	L/E	2/2	**wE**	5						
		Structural Analysis II	L/E				2/2	**wE**	5			
Structural Engineering	Basics of Reinforced Concrete [BFP2]	Basics of Reinforced Concrete I	L/E				2/1	**wE**	4			
		Basics of Reinforced Concrete II	L/E							2	**wE**	2
	Basics in Steel and Timber Structures [BFP3]	Basics in Steel Structures	L/E				2/1	**wE**	4			
		Basics in Timber Structures	L/E				2/1	**wE**	4			
Water and Environment	Water and Environment [BFP4]	Hydraulic Engineering and Water Management	L/E				2/1		[3]		**wE**	12 [6]
		Hydrology	L/E				2/1		[3]			
		Sanitary Environmental Engineering	L/E							2/1		
Mobility and Infrastructure	Mobility and Infrastructure [BFP5]	Spatial Planing and Planing Law	L/E	2/1	ngA [1] ngA [1] **wE**	12						
		Transportation	L/E	2/1								
		Design Basics in Highway Engineering	L/E	2/1								
Technology and Management in Construction	Technology and Management in Construction [BFP6]	Construction Technology	L/E	3/1	**wE**	11						
		Economics in Construction Operation	L/E	2/1								
		Facility and Real Estate Management I	L	1								
Geotechnical Engineering	Geotechnical Engineering [BFP7]	Basics in Soil Mechanics	L/E	2/2	**wE**	5.5						
		Basics in Foundation Engineering	L/E				2/2	**wE**	5.5			
Supplements in Engineering	Supplements in Engineering [BFW11]	selection (8 CP have to be taken)		0-6	ngA	0-6	0-4	ngA	0-4	0-8	ngA	0-8
Bachelor's Thesis	Module Bachelor's Thesis [BSC]											12
Total				25-31	4E + 2-6nA	33.5-39.5	23-27	5E + 0-2nA	22.5-26.5	5-13	2E + 0-4nA	26-34

In the module Supplements in Engineering, the components can be selected from the available offer (see below). The learning controls to all selectable courses are not graded.

Subject	Module [Code (baui)]	Course	Type	4. semester			5. semester			6. semester		
				HpW	LC	CP	HpW	LC	CP	HpW	LC	CP
Supplements in Engineering	Supplements in Engineering [BFW11]	Partial Differential Equations	L/E	1/1	ngA	2						
		Introduction to Continuum Mechanics	L	2	ngA	2						
		Physical Modelling in River Engineering	L							2	ngA	2
		Project 'Plan, Design, Engineering'	Pj							2	ngA	2
		Life Cycle Management	L/E							2	ngA	2
		Engineering Hydrology	L/E							2	ngA	2
		Introduction to Computer Programming II	L/E	1/1	ngA [1)] ngA	2						
		Computer Aided Design (CAD)	L/E				2	ngA	2			
		Trades and Technology in Turnkey Construction	L/E				2	ngA	2			

Admission to the examinations in the subjects Structural Engineering, Water and Environment as well as Geotechnical Engineering requires, that the module examinations in the subjects Mechanics and Mathematics as well the module examination Building Constructions are all but two passed.

Furthermore, the **Bachelor's Thesis** (12 CP) is part of the Basic Subject Studies. The admission to the Bachelor's Thesis requires, that the student has completed all modules of the Basic Studies (90 CP) and modules in extent of 30 CP from the Basic Subject Studies.

Additional Studies

Voluntary **additional accomplishments** can be taken in extent of max. 30 CP from the entire offer at KIT (comp. ER/SPO § 15). If a module is completed by the additional accomplishment it can be included in the bachelor degree certificate as additional module on request of the student.

In addition, modules in extent of max. 30 CP can be taken from a consecutive master degree program (e.g. 5 modules of the master degree program Civil Engineering) as **prior master's examinations** (comp. ER/SPO § 15a) if the student completed modules in extent of more than 120 CP in the bachelor degree program . These can be credited in a future master degree program. With this, students are able to customize the interdisciplinary studies to their personal needs, interests and professional perspectives in terms of content as well as time.

explanations to the tables:

in general:

LC	learning control
CP	credit point
HpW	hours per week

type of course:

L	lecture
L/E	lecture and exercise, separate or integrated
P	practical training
Pj	study project

type of learning control:

wE	written examination
OE	orientation examination
ngA	not graded accomplishment
ngA [1)]	not graded accomplishment as examination prerequisite

2.3 Selection options, completion of a module

Every module and every examination has to be taken not more than once (comp. ER/SPO § 7 par. 5). Since all modules in the degree program are compulsory modules, there exists no option to select on the level of modules. Within the modules with selectable learning controls the student makes a decision at the time when registering to the respective learning control (comp. SPO § 5 par. 2). The student can revoke this mandatory selection only by canceling the registration to the learning control in time. After taking the learning control the selected learning control can be moved to the Additional Accomplishments and replaced by another one only by request to the Examination Committee Bachelor Civil Engineering.

A module is completed when all learning controls assigned to the module are passed, i.e. either evaluated as examination with grade '4.0' at minimum or as not graded accomplishment with 'passed'.

2.4 Orientation Examination, repetition of examinations, deadlines

Orientation Examinations are the examinations in the module Statics of Rigid Bodies as well as the partial modules Theory of Building Materials and Building Physics (comp. ER/SPO § 8). These have to be taken by the end of the examination period of the second subject-related semester. Those who do not pass the Orientation Examinations including possible repeated examinations before the end of the examination period of the third subject-related semester will lose the examination entitlement in Civil Engineering. A second repetition of the Orientation Examinations is impossible.

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 overall 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 (finally 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** (s. http://www.ifv.kit.edu/pab.php; *in German*) has to be made without delay after loosing the examination entitlement. Requests for a second repetition of an examination require the approval of the Examination Committee Bachelor Civil Engineering. A counseling interview is strongly recommended. 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.

A possible request for an **extension of deadline** has to be submitted to the Examination Committee Bachelor Civil Engineering. This request is also decided by the Examination Committee Bachelor Civil Engineering.

Further information is available in the examination regulation (ER/SPO, http://www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2017_AB_010.pdf; *in German*) and from Examination Committee Bachelor Civil Engineering or the 'Fachschaft' (student council).

2.5 Students in special circumstances

Students in special circumstances are students with disabilities, 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 of 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 also SPO § 12 and 13 according to Satzung zur Änderung der Regelungen über den Nachteilsausgleich in den Studien- und Prüfungsordnungen, Artikel 3; *in German*).

For compensation for a disadvantage, the student should submit an informal application to the Examination Committee Bachelor Civil Engineering and provide the appropriate proof. The Examination Committee Bachelor Civil Engineering decides on the application as well as on the kind and extend of the individually necessary measures and informs the student.

2.6 Crediting and recognition of obtained accomplishments otherwise

In general, accomplishments obtained otherwise can be recognized under the conditions of the ER/SPO § 19. The recognition has to be made with the corresponding recognition form of the Examination Committee Bachelor Civil Engineering (http://www.ifv.kit.edu/pab.php; *in German*).

If the accomplishments are mainly **identical** with modules from the curriculum (name, objectives, content) the respective lecturer confirms this is 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. The recognition and crediting which parts of the curriculum can be replaced is defined by the Examination Committee Bachelor Civil Engineering.

The recognition of accomplishments obtained **outside of the higher education system** is also stated on the corresponding recognition form of the Examination Committee Bachelor Civil Engineering (http://www.ifv.kit.edu/pab.php; *in German*). A recognition is possible if the obtained competences contribute to achieve the qualification goals of the study program. The Examination Committee Bachelor 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 50 % of the higher education study can be replaced.

The recognition form has to be submitted to the bachelor Examination Committee Bachelor Civil Engineering which transfers it for crediting the accomplishments.

2.7 Bachelor's Thesis

The **Bachelor's Thesis** is usually carried out in the third year of studying (comp. also ER/SPO § 14). The topic of the bachelor's thesis has to be assigned by a professor, a leading scientists according to § 14 par. 3 no. 1 KITG or an academic assistant given the examining permission of the KIT Department of Civil Engineering, Geo- and Environmental Sciences (comp. ER/SPO § 14 par. 2). A topic assigned by an equivalent person of another KIT department needs permission of the Examination Committee Bachelor Civil Engineering. Students' wishes can be considered when drafting the topic. If the bachelor'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 bachelor's thesis after successfully passing all modules of the Basic Studies, 90 CP, and modules of the Basic Subject Studies to an extent of 30 CP. The supervisor initiates the bachelor's thesis to be uploaded to the campus management system. After notification via e-mail, the bachelor's thesis has to be **registered online** at the portal Campus Management for Students. The **admission** follows after the required prerequisites and eventual further conditions are verified. These steps have to be completed **before starting** the thesis (scheduled starting date).

The **preparation time** is three months. The bachelor's thesis can be written also in English. Within one month after submission it has to be completed with a **presentation** which is considered in the grading.

2.8 Interdisciplinary Qualifications, Internship

In order to obtain the credit points (6 CP) in the module **Interdisciplinary Qualifications** (comp. also ER/SPO § 16) courses from the offer on key competences of the KIT House of Competence (HoC) as well as the Centre for Cultural and General Studies (ZAK), courses from the General Studies offered by ZAK or language courses of the 'Sprachenzentrum' (SpZ, center of language studies) can be taken. All courses from the civil engineering programs offered by ZAK as key competences or in the General Studies are excluded. In special cases the Examination Committee Bachelor Civil Engineering can permit or approve further suitable courses as interdisciplinary qualifications beyond the mentioned options.

Courses on key competences of HoC and ZAK as well as the language courses of SpZ are registered directly at HoC, ZAK or SpZ. The examinations results are typically uploaded as 'Not assigned grades'. The students can **assigned them in two steps**. Firstly, they **select** the corresponding 'Teilleistungen' 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 Bachelor 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 Bachelor Civil Engineering.

An **Internship** is strongly recommended even if it not included in the curriculum. It offers important insights in the professional practice. There, interdisciplinary qualifications can be obtained including capacity in communication and teamwork. The Internship can be completed in companies of the construction industry or in consultant companies, which are in charge of planning, construction or maintenance of construction activities. The students shall become acquainted with and reflect the internal process management and the cooperation between contracting parties. If the duration of the internship is at least 6 weeks the crediting of CPs is possible in the module Interdisciplinary Qualifications. The proof is made by an internship report, that has to contain the carried out work as well as the explanation of the obtained interdisciplinary qualifications. The 'Praktikumsamt' (internship office) defines the extent of the credited CPs on base of the submitted proof. At maximum a recognition up to 3 CP is possible. A consultation about the recognition of an internship is recommended in advance.

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

2.9 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. Planning a semester abroad, it is generally recommended to consult the Students' Advisory Service in advance with regard to the possibility of crediting the envisaged accomplishments in the curriculum. The proposed learning agreement has to be approved and signed by the Erasmus Coordinator.

2.10 Additional accomplishments, prior master's transfer account

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. Not graded accomplishments not taken within the modules Basics in Engineering II or Supplements in Engineering can be selected as additional accomplishments within the module Further Examinations. The online registration to one of these exams requires first the selection of this module and then the desired 'Teilleistungen'. 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. If the designated additional accomplishment or additional modules is not available in that list then this must be conveyed to the Study Program Service at the department via e-mail. The desired selection will then be available in the campus management system enabling the online exam registration within the registration period. The assignment can be changed later by sending a request to the Examination Committee Bachelor Civil Engineering.

All additional accomplishments are listed in the transcript of records. Completed modules can be included in the bachelor degree certificate as additional modules if requested by the student.

An internship (see chapt. 2.8) of min. 4 weeks and max. 8 weeks duration can also be recognized as additional accomplishment with max. 10 CP. A description of interdisciplinary qualifications is not required.

Furthermore, up to 30 CP or five modules from the master degree programs Civil Engineering, Engineering Structures, Mobility and Infrastructure, Technology and Management in Construction or Water Science and Engineering can be selected on the **prior master's transfer account** (comp. ER/SPO § 15a), as far as already 120 credit points are obtained within the bachelor studies. This shall enable an easier transition to the consecutive master studies out of the standard period of study. The designated prior master's examination shall be conveyed also to the Study Program Service of the department via e-mail. The desired selection will then be available in the campus management system enabling the online exam registration within the registration period.

It has to be considered absolutely that prior master's examination can be taken only during the bachelor studies. This means that an examination or not graded accomplishment has to be completed before the master studies are started. The grade is credited within the bachelor studies even if it is booked after starting the master studies. Prior master's examinations will be transferred to the master studies only by request and not automatically. The request of transfer to the master studies has to be submitted at the beginning of the master studies, i.e. the first semester.

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 extent of the modules (in CP),
- the placement of the module in the course of study,
- the learning outcomes of the modules,
- the type of assessment and examinations,
- the calculation of the module's grade,
- the interdependencies of the modules, required prerequisites, and
- the associated courses (HpW).

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 examination can be spread out over several semesters. Not graded accomplishments can also be part of the module examination, e.g. as examination prerequisites.

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 to 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.

The Examination Committee Bachelor Civil Engineering (http://www.ifv.kit.edu/pab.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. During the bachelor studies no changes are expected in general. However, courses and the assigned learning controls or the module examinations 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 Mohrlok
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 Bachelor Civil Engineering:

Prof. Dr.-Ing. Peter Vortisch (chairperson)
Kim Kandler, M.Sc. (person in charge)
Jan Vallée, M.Sc. (person in charge)
Institute for Transport Studies, Bldg. 10.30, R. 321
consultation: Mo. 14.00 – 15.00 h
Email: pab@bgu.kit.edu
Web: http://www.ifv.kit.edu/pab.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

'Praktikumsamt' (internship office):

Dr.-Ing. Andreas Kron
Institute for Water and Environment, Bldg. 10.89, R. 103 (1st floor)
consultation: on appointment
Phone: 0721/608-48421
Email: Kron@kit.edu
Web: https://wb.iwu.kit.edu/education.php

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

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.

none

5 Modules

M 5.1 Module: Structural Analysis (bauiBFP1-BSTAT) [M-BGU-101752]

Responsible: Prof. Dr.-Ing. Steffen Freitag
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Structural Analysis

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
10	Grade to a tenth	Each summer term	2 terms	German	3	1

Mandatory			
T-BGU-103387	Structural Analysis I	5 CR	Freitag
T-BGU-103388	Structural Analysis II	5 CR	Freitag

Competence Certificate
- 'Teilleistung' T-BGU-103387 with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-BGU-103388 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 assign and apply the essential steps for modeling and calculating 2D- and 3D-beam structures. Hence, they are able to calculate and interpret the displacement and stress resultant fields for the design and construction of associated structures. The students practice logical and abstract thinking by deriving and applying methods of structural analysis. They transfer this knowledge to the application of computer based computations and they evaluate their results.

Content
Calculation of statical determined and un-determined 2D- and 3D-Beam Structures:

- idealisations
- load bearing behaviour
- stress resultants
- discrete displacements
- controls
- symmetry
- application of numerical programs
- influence lines, KV, VV
- FEM for 2d truss structures
- prestressing

Outlook: surface structures, FE-modeling, nonlinearities

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):

- Structural Analysis I lecture, exercise, tutorial: 75 h
- Structural Analysis II lecture, exercise, tutorial: 75 h

independent study:

- preparation and follow-up lectures, exercises Structural Analysis I: 15 h
- examination preparation Structural Analysis I: 60 h
- preparation and follow-up lectures, exercises Structural Analysis II: 15 h
- examination preparation Structural Analysis II: 60 h

total: 300 h

Recommendation
none

Literature
Vorlesungsmanuskript Baustatik I
Vorlesungsmanuskript Baustatik II
Krätzig, W.B., Harte, R., Meskouris, K., Wittek, U. (1999): Tragwerke 1 - Theorie und Berechnungsmethoden statisch bestimmter Stabtragwerke, Springer.
Krätzig, W.B., Harte, R., Meskouris, K., Wittek, U. (2005): Tragwerke 2 - Theorie und Berechnungsmethoden statisch unbestimmter Stabtragwerke, Springer.
Wunderlich, W., Kiener, G. (2004): Statik der Stabtragwerke, Teubner.

M 5.2 Module: Basics of Reinforced Concrete (bauiBFP2-KSTR.A) [M-BGU-103696]

Responsible: Prof. Dr.-Ing. Alexander Stark
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Structural Engineering

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	2 terms	German	3	1

Mandatory			
T-BGU-103389	Basics of Reinforced Concrete I	4 CR	Stark
T-BGU-103390	Basics of Reinforced Concrete II	2 CR	Stark

Competence Certificate
- 'Teilleistung' T-BGU-103389 with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-BGU-103390 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 principle load-bearing behavior of the composite material reinforced concrete as well as to combine the already acquired knowledge from the modules in mechanics, 'Structural Analysis', 'Building Materials' and 'Building Construction', to transfer and apply it to reinforced concrete. Thus, they are able to design load-bearing structures of the usual building construction on the basis of the current norms and structural elements with regard to the reinforcement layout.

Content

- material properties and composite behavior of concrete and steel
- ultimate limit state and introduction to the serviceability limit state design methods
- design of typical reinforced concrete cross-sections and components for bending with longitudinal and transverse force and torsion
- introduction to column and punching shear design

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):

- Basics of Reinforced Concrete I lecture, exercise: 45 h
- Basics of Reinforced Concrete II lecture/exercise: 30 h

independent study:

- preparation and follow-up lectures, exercises Basics of Reinforced Concrete I: 15 h
- examination preparation Basics of Reinforced Concrete I: 45 h
- preparation and follow-up lecture/exercises Basics of Reinforced Concrete II: 15 h
- examination preparation Basics of Reinforced Concrete II: 30 h

total: 180 h

Recommendation
none

Literature
scriptum (slides of the lecture) and notes by the students are required;

DIN EN 1992-1-1 + national appendix for Germany, current issue

M 5.3 Module: Basics in Steel and Timber Structures (bauiBFP3-KSTR.B) [M-BGU-103697]

Responsible: Prof. Dr.-Ing. Philipp Dietsch
Prof. Dr.-Ing. Thomas Ummenhofer
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Structural Engineering

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

Mandatory			
T-BGU-107462	Basics in Steel Structures	4 CR	Ummenhofer
T-BGU-107463	Basics in Timber Structures	4 CR	Dietsch

Competence Certificate
- 'Teilleistung' T-BGU-107462 with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-BGU-107463 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 basic characteristics of the construction materials steel and timber. They can analyze and evaluate the the load carrying effects of steel and timber structures under consideration of the specific properties of both building materials and their reaction towards environmental conditions. The students can apply material specific common structural elements and connections. They are able to apply design for stability.

Content
In the Basics of Steel Structures, the focus is given to the design and construction of structural steel components and their connections:

- materials and design concept, cross-section classification
- structural elements and load bearing systems: beams and columns, load-bearing systems in steel construction (e.g. hall, storey, and steel skeleton construction)
- design of structural elements under bending and tension
- stability verification of beam-shaped components under compression and bending
- connections in steel structures: bolted and welded connections, constructive design

In the Basics of Timber Structures, focus is given to the connection and application of the knowledge obtained in the basic courses in structural analysis and mechanics with the normative design under consideration of the special characteristics of timber as a construction material:

- basics: timber in construction, wood properties wood as building material, timber products, limit state design,
- design of structural elements: tension and compression, bending, shear and torsion, columns and buckling lengths, lateral torsional buckling and bracing systems
- connections: mechanical connections, laterally loaded fasteners (bolts and dowels), axially loaded fasteners (screws), group effects, carpentry connections, glued joints
- construction: tension perpendicular to the grain, durability and protection, cross-laminated timber, fire protection

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):

- Basics in Steel Structures lecture, exercise: 45 h
- Basics in Timber Structures lecture, exercise: 45 h

independent study:

- preparation and follow-up lectures, exercises Basics in Steel Structures: 20 h
- examination preparation Basics in Steel Structures: 55 h
- preparation and follow-up lecture/exercises Basics in Timber Structures: 20 h
- examination preparation Basics in Timber Structures: 55 h

total: 240 h

Recommendation
none

Literature
lecture notes 'Basics in Steel Structures', Versuchsanstalt Stahl, Holz und Steine, KIT

DIN EN 1993-1-1, Dezember 2010: Eurocode 3: Bemessung und Konstruktion von Stahl-bauten – Teil 1-1: Allgemeine Bemessungsregeln und Regeln für den Hochbau: Beuth Verlag GmbH, Berlin.

DIN EN 1993-1-5, Dezember 2010: Eurocode 3: Bemessung und Konstruktion von Stahlbauten – Teil 1-5: Plattenförmige Bauteile: Beuth Verlag GmbH, Berlin.

DIN EN 1993-1-8, Dezember 2010: Eurocode 3: Bemessung und Konstruktion von Stahlbauten – Teil 1-8: Bemessung von Anschlüssen: Beuth Verlag GmbH, Berlin.

lecture notes (slides) 'Basics in Timber Structures', annotations by the students is required

Blaß, H.J. & Sandhaas, C.: Ingenieurholzbau – Grundlagen der Bemessung. KIT Scientific Publishing, Karlsruhe.

Colling, F.: Holzbau - Grundlagen und Bemessung nach EC 5. Springer Vieweg, Berlin.

Winter, S., Peter, M. Holzbau Taschenbuch. Ernst&Sohn, Berlin.

DIN EN 1995-1-1:2010-12 mit DIN EN 1995-1-1/NA:2013-08: Eurocode 5: Bemessung und Konstruktion von Holzbauten – Teil 1-1: Allgemeine Bemessungsregeln und Regeln für den Hochbau. Beuth Verlag, Berlin.

DIN EN 1995-1-2:2010-12 mit DIN EN 1995-1-2/NA:2010-12: Eurocode 5: Eurocode 5: Bemessung und Konstruktion von Holzbauten - Teil 1-2: Allgemeine Regeln - Tragwerksbemessung für den Brandfall. Beuth Verlag, Berlin.

M 5.4 Module: Water and Environment (bauiBFP4-WASSER) [M-BGU-103405]

Responsible: PD Dr.-Ing. Stephan Fuchs
Prof. Dr. Mario Jorge Rodrigues Pereira da Franca
Dr.-Ing. Frank Seidel
Prof. Dr.-Ing. Erwin Zehe

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

Part of: Water and Environment

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
12	Grade to a tenth	Each winter term	2 terms	German	3	1

Mandatory			
T-BGU-106800	Water and Environment	12 CR	Fuchs, Rodrigues Pereira da Franca, Seidel, Zehe

Competence Certificate
- 'Teilleistung' T-BGU-106800 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 describe the relevant processes upon which the water cycle is based on as well as the tasks of a consulting engineer with respect to water management and sanitation. They can explain in which way particularly anthropogenic caused changes impact on hydrological processes, change these and what kind of requirements for the tasks in water management and sanitation result from these. They are able to plan and design water management measures and sanitary facilities for specific applications and functions by evaluating data and information and classifying them in to the context of their problem.

Content
The module imparts the fundamentals in the water sector essential for civil engineering. Here, the fundamental processes as well as technical aspects are considered. Important topics are:

- processes of the water cycle and water balance
- discharge and discharge generation
- soil hydrology
- modeling concepts in catchment hydrology
- principles and applications of open channel flow
- sediment transport in rivers
- facilities for discharge control / hydraulic structures
- processes in urban water management
- sanitary engineering
- storm water treatment
- waste water treatment

Module grade calculation
grade of the module is grade of the exam

Annotation
none

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

- Hydraulic Engineering and Water Management lecture, exercise: 45 h
- Hydrology lecture, exercise: 45 h
- Water Supply and Sanitation lecture, exercise: 45 h

independent study:

- preparation and follow-up lectures, exercises Hydraulic Engineering and Water Management: 45 h
- preparation and follow-up lectures, exercises Hydrology : 45 h
- preparation and follow-up lectures, exercises Water Supply and Sanitation: 45 h
- examination preparation: 90 h

total: 360 h

Recommendation
The course Environmental Physics / Energy (6200112) should be attended.

M 5.5 Module: Mobility and Infrastructure (bauiBFP5-MOBIN) [M-BGU-103486]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Mobility and Infrastructure

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

Mandatory			
T-BGU-106832	Term Papers Transportation	0 CR	Vortisch
T-BGU-106833	Term Papers Highway Engineering	0 CR	Zimmermann
T-BGU-101791	Mobility and Infrastructure	12 CR	Vortisch

Competence Certificate
- 'Teilleistung' T-BGU-106832 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite
- 'Teilleistung' T-BGU-106833 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite
- 'Teilleistung' T-BGU-101791 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 and explain the basic methods and procedures to deal with general problems in spatial planning, transport studies and highway engineering. They are able to examine fundamental calculations related to the mentioned subjects and to use the required tools in a methodically appropriate way. Further, they can argue specialized, find, develop and evaluate solutions.

Content
The module is divided into 3 parts:
The part Spatial Planning and Planning Law involves basic tasks and problems on different planning levels such as land use and conflicts, provision of services and infrastructure as well as their costs, planning on local, regional, national and European level.
The fundamentals of transportation planning (convention for analyses, surveys of travel behaviour) and traffic engineering are covered by the part Transport Studies.
The part Design Basics in Highway Engineering involves road network layout, principles of highway design, driving dynamics, earthworks as well as pavements and their dimensioning.

Module grade calculation
grade of the module is grade of the exam

Annotation
None

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

- Spatial Planning and Planning Law lecture, exercise: 45 h
- Transportation lecture, exercise: 45 h
- Design Basics in Highway Engineering lecture, exercise:45 h

independent study:

- preparation and follow-up lectures, exercises Spatial Planning and Planning Law: 30 h
- preparation and follow-up lectures, exercises Transportation: 15 h
- preparation and follow-up lectures, exercises Design Basics in Highway Engineering: 15 h
- preparation of student research papers: 80 h
- examination preparation: 80 h

total: 355 h

Recommendation
none

M 5.6 Module: Technology and Management in Construction (bauiBFP6-TMB) [M-BGU-101754]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Technology and Management in Construction Operation

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

Mandatory			
T-BGU-103392	Technology and Management in Construction	11 CR	Haghsheno

Competence Certificate
- 'Teilleistung' T-BGU-103392 with written examination according to § 4 Par. 2 No. 1

details about the learning control see at the 'Teilleistung'

Prerequisites
none

Competence Goal
After completion of the module Technology and Management in Construction Operation the students are able to work on common technical and economic problems in construction operation.During the lecture Construction Technology the students obtain the ability to compare different construction technologies. They can list different machinary and methods and compare and evaluate their advantages and disadvantages. They are able to run basic production calculations in different fields of construction management with respect to their later professional life. They can apply common design tools for this purpose. Furthermore, they understand different theoretical topics of different fields in construction management and can these explain and interlink with each other.In the economic field, students can perform calculations of internal and external accounting. They can perform simple bookings for creating a balance sheet, select investment alternatives using appropriate methods of investment appraisal and are able to discuss the processes involved in the calculation of building projects. Furthermore, students can explain the pros and cons of different topics of the construction sector. On selected topics in the construction contract law, students can take a position.In the area of facility and real estate management, they can describe the specifics of tenancy and perform a service charge settlement. Furthermore, they understand the growing importance of sustainability in real estate management.

Content

- preliminary project phases and calculation methods
- work preparation and construction work
- construction techniques in structural engineering, underground engineering and earthworks
- basics of machine technology
- accounting and balancing
- financing and investment
- law of contract HOAI / VOB
- fundamentals of facility and real estate management

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 Technology lecture, exercise: 60 h
- Economics in Construction Operation lecture, exercise: 45 h
- Facility- and Real Estate Management lecture: 15 h

independent study:

- preparation and follow-up lectures, exercises Construction Technology: 45 h
- preparation and follow-up lectures, exercises Economics in Construction Operation: 30 h
- preparation and follow-up lectures Facility- and Real Estate Management: 10 h
- examination preparation: 125 h

total: 330 h

Recommendation
none

M 5.7 Module: Geotechnical Engineering (bauiBFP7-GEOING) [M-BGU-103698]

Responsible: Prof. Dr.-Ing. Hans Henning Stutz
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Geotechnical Engineering

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
11	Grade to a tenth	Each summer term	2 terms	German	3	2

Mandatory			
T-BGU-112814	Basics in Soil Mechanics	5,5 CR	Stutz
T-BGU-112815	Basics in Foundation Engineering	5,5 CR	Stutz

Competence Certificate
- 'Teilleistung' T-BGU-112814 with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-BGU-112815 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 have a scientifically sound understanding of the building material 'soil' with respect to its appearance and mechanical behaviour. They are able to describe the latter on base of soil mechanical and soil hydraulic models, to classify and to analyse respective field and laboratory tests. Because of their knowledge in usual geotechnical construction methods they can independently select, design and describe the construction process for standard applications, such as building foundations, construction pit linings and tunnels adapted to the respective ground and groundwater conditions. Further, they are able to proof independently ultimate limit states and serviceability limit states of those geotechnical constructions and natural slopes and to evaluate the results critically.

Content
The module imparts theoretical principles of soil behavior and demonstrates their practical application in designing of the most common geotechnical constructions. This covers:

- standards, codes and safety concepts in foundation engineering
- subsoil investigation, soil classification, soil properties and soil parameters
- permeability, seepage and groundwater management
- stress distributions in the subsoil, compression behavior and consolidation
- shear resistance of soils, stability of slopes and foundations
- design and settlement calculation of shallow foundations
- earth pressure and earth resistance, design of retaining structures and retaining walls for excavations
- pile foundations, deep foundations and caisson foundations in open water
- methods for soil improvement
- introduction to tunneling

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):

- Basics in Soil Mechanics lecture, exercise, tutorial: 90 h
- Basics in Foundation Engineering lecture, exercise, tutorial: 90 h

independent study:

- preparation and follow-up lectures, exercises Basics in Soil Mechanics: 30 h
- preparation and follow-up lectures, exercises Basics in Foundation Engineering: 30 h
- examination preparation Basics in Soil Mechanics (partial examination): 45 h
- examination preparation Basics in Foundation Engineering (partial examination): 45 h

total: 330 h

Recommendation
The attendance of the lecture accompanied tutorials (6200417, 6200517) is recommended.

The not graded accomplishment Geology in Civil Engineering [T-BGU-103395] shall be passed.

Further, it is highly recommended to take the partial examination Basics in Soil Mechanics before taking the partial examination Basics in Foundation Engineering.

Literature
Gudehus, G (1981): Bodenmechanik, F. Enke

Grundwissen "Der Ingenieurbau" (1995) Bd. 2: Hydrotechnik – Geotechnik, Ernst u. Sohn

Lang, H-J, Huder, J, Amann, P, Puzrin A.M. (2011): Bodenmechanik und Grundbau, Springer Verlag

Kolymbas, D.: Geotechnik, Springer-Verlag 5. Auflage

M 5.8 Module: Supplements in Engineering (bauiBFW11-INGERG) [M-BGU-103695]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Supplements in Engineering

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
8	pass/fail	Each term	2 terms	German	3	3

Election notes
There are four not graded accomplishments to the offered courses to be taken.

Compulsory electives Basic Subject Studies (Election: 8 credits)			
T-MATH-103326	Partial Differential Equations - Exam	2 CR	Grimm, Hochbruck, Neher
T-BGU-107466	Introduction to Continuum Mechanics (not graded)	2 CR	Seelig
T-BGU-107467	Physical Modelling in Hydraulic Engineering	2 CR	Seidel
T-BGU-107469	Project 'Plan, Design, Engineering'	2 CR	Vortisch
T-BGU-107470	Life Cycle Management	2 CR	Dehn, Lennerts
T-BGU-103399	Programming Exercises Introduction to Computer Programming II	0 CR	Uhlmann
T-BGU-103398	Introduction to Computer Programming II	2 CR	Uhlmann
T-BGU-107473	Computer Aided Design (CAD)	2 CR	Haghsheno
T-BGU-108942	Engineering Hydrology (not graded)	2 CR	Ehret
T-BGU-110821	Trades and Technology in Turnkey Construction	2 CR	Haghsheno

Competence Certificate
Four of the listed learning controls have to taken. They can be selected freely.

- 'Teilleistung' T-MATH-103326 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-107466 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-107467 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-107469 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-107470 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-103399 with not graded accomplishment according to § 4 Par. 3, as examination prerequisite to 'Teilleistung' T-BGU-103398
- 'Teilleistung' T-BGU-103398 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-107473 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-108942 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-110821 with not graded accomplishment according to § 4 Par. 3

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

Prerequisites
none

Competence Goal
Students can describe additional knowledge from the selcted subject areas and explain subject-specific methods. They can describe relationships and methods and can apply them to simple problems from civil engineering.

if selecting **Partial Differential Equations**:
Students acquire basic knowledge of numerical solution methods for partial differential equations and can thus name and explain the mathematical principles for understanding qualitative and quantitative models from engineering science. They are able to independently and confidently apply the discussed methods to the mathematical modeling of engineering problems and to solve the resulting mathematical problem using the selected tools.

if selecting **Introduction to Continuum Mechanics**:
Using the fundamentals of analyzing multiaxial load and deformation states in elastic solids, students are able to formulate technical problems as boundary value problems and interpret their solutions in an engineering manner - for example with regard to load application issues or stress concentrations. In addition to analytical solution methods for plane problems, they can use variation and energy methods in particular, which are the basis of numerical calculation methods such as the finite element method.

if selecting **Physical Modelling in Hydraulic Engineering**:
Students can explain the possible uses and application limits of hydraulic engineering experiments in the context of water management problems. They are able to carry out model planning and evaluate the reliability of the obtained results.

if selecting **Project 'Plan, Design, Engineering'**:
Students can understand the planning requirements of the various areas of the focus Mobility and Infrastructure and discuss them in relation to a specific example. Under professional guidance, they can find practicable solutions and roughly understand the multidisciplinary planning processes. In addition, they can work in a self-organized manner and have organizational and didactic skills related to teamwork and presentations.

if selecting **Life Cycle Management**:
Students can explain the life cycle phases of buildings, their specific characteristics and their influence on the environment. They can describe the influencing factors that have an impact on the service life of components, the methods of durability forecasting and the maintenance measures (maintenance, inspection, repair and improvement). They know suitable calculation methods as well as their required input variables and can carry out simple life cycle cost calculations.

if selecting **Introduction to Computer Programming II**:
Students can describe the algorithms used for digital data processing. They are able to apply their programming knowledge of object-oriented programming to practical examples.

if selecting **Computer Aided Design (CAD)**:
Students have a deeper understanding of the application of CAD in civil engineering and can explain the associated basics. In addition, they are able to independently model the shell contruction and finishing of simple buildings, generate sections, views and visualizations and present them in plans.

if selecting **Engineering Hydrology**:
Students can describe the basic principles of model in engineering hydrology. They are able to apply the models for the design of water management/hydraulic engineering facilities and measures and they can describe the application limits and the existing uncertainties. They can explain the relevant regulations that must be considered and complied with, particularly for safety-relevant verifications of dams.

if selecting **Trades and Technology in Turnkey Construction**:
Students can describe the basic process and execution techniques in shell construction and finishing as well as technical building equipment.

Content
in accordance to the selected courses:

Partial Differential Equations, mathematical methods:

- numerical treatment of large linear equation systems
- difference methods for parabolic and hyperbolic differential equations
- Finite Element Method for elliptic problems

Introduction to Continuum Mechanics, mathematical methods:

- vector and tensor calculus, index notation
- stresses and equilibrium
- displacements and distortions
- linear-elastic constitutive law
- boundary value problems in the theory of elasticity
- plane problems
- Airy's stress function
- local stress concentrations
- working and energy principles of the theory of elasticity
- approximation methods

Physical Modelling in Hydraulic Engineering, experimental methods:
The course provides a comprehensive overview of the use of models to optimize hydrodynamic processes. The following contents are covered:

- definition of the term model
- model similarity and model laws
- limits of the transferability of results
- model planning and structure
- hydrometry and data analysis
- application of hydraulic engineering models in practice

Project 'Plan, Design, Engineering', planning methods:
Students work on a typical task from planning practice in spatial and infrastructure planning (e.g. urban planning ideas competition). Within groups, students take on specific planning tasks from the fields of urban planning, transportation, highway enigineering and track-guided transport systems, with mentors providing the technical background. During the planning game, specific solutions are developed and presented in varying degrees of detail.

Life Cycle Management, sustainability considerations:
The concepts of life cycle management are introduced in particular using the various methods for calculating and optimizing life cycle costs. A further focus is the introduction to the methodology of damage detection and damage modeling, which are necessary for the accurate assessment of the degree of damage and the implementation of service life forecasts for concrete structures. The assessment of structural durability is carried out on the basis of reliability considerations. It is therefore necessary to become familiar with the basic principles of reliability theory. Only then is it possible to carry out a probabilistic service life assessment of building structures that are exposed to environmental stresses (frost, salts, carbon dioxide, etc.). Furthermore, the course also includes an introduction to the methodology of maintenance planning and implementation for concrete structures that have experienced various types of damage relevant to durability.

Introduction to Computer Programming II, methods of data processing and digital planning tools:

- introduction to object-oriented programming: basic elements of object-oriented programming languages and their realization in a widely used high-level programming language
- exercises on the implementation of common algorithms, applications to problems in engineering

Computer Aided Design (CAD), methods of data processing and digital planning tools:
The historical development of computer-aided drawing and design is covered and the theoretical basics necessary for understanding and applying CAD are taught. In addition, CAD exercises are offered for practical application in order to create the basis for later work according to the Building Information Modeling (BIM) method. As part of an exercise, a building is to be modeled independently in Revit.

Engineering Hydrology, methods in environmental management:

- rainfall-runoff models for the design and operation of water management/hydraulic engineering facilities for flood protection
- design of flood retention basins as an application example

Trades and Technology in Turnkey Construction, interrelationships in construction processes:
Implementation planning for shell construction, finishing and building services as well as basic principles and construction work for various building trades (e.g. dry construction, screed or frontage work) are taught. Technical construction (technical building equipment) is also part of the subjects taught together with basic principles and construction work for areas such as heating and domestic hot water systems, ventilation and air conditioning systems or electrical installations.

Module grade calculation
not graded

Annotation
none

Workload
contact hours (1 HpW = 1 h x 15 weeks), depending on the selected course:

- Partial Differential Equations lecture, exercise: 30 h
- Introduction to Continuum Mechanics lecture: 30 h
- Physical Modelling in Hydraulic Engineering lecture: 30 h
- Project 'Plan, Design, Engineering' (PEK) appointment on site, project and team meetings, presentations: 16 h
- Life Cycle Management lecture/exercise: 30 h
- Introduction to Computer Programming II lecture, exercise: 30 h
- Computer Aided Design (CAD) lecture/exercise: 30 h
- Engineering Hydrology lecture/exercise: 30 h
- Trades and Technology in Turnkey Construction lecture/exercise: 30 h

independent study,depending on the selected course:

- preparation and follow-up lectures, exercises Partial Differential Equations: 10 h
- test preparation Partial Differential Equations: 20 h
- preparation and follow-up lectures Introduction to Continuum Mechanics: 15 h
- test preparation Introduction to Continuum Mechanics: 15 h
- preparation and follow-up lectures Physical Modelling in Hydraulic Engineering, preparation of experiment reports: 30 h
- preparation and follow-up project meetings 'PEK': 6 h
- preparation of group exercise 'PEK' (part per person): 35 h
- preparation and follow-up lecture/exercises Life Cycle Management: 10 h
- test preparation Life Cycle Management: 20 h
- preparation of programming exercises Introduction to Computer Programming II (prerequisite): 15 h
- test preparation Introduction to Computer Programming II: 15 h
- preparation of exercise report Computer Aided Design (CAD): 30 h
- preparation and follow-up lectures/exercises Engineering Hydrology: 10 h
- test preparation Engineering Hydrology: 20 h
- preparation and follow-up lectures/exercises Trades and Technology in Turnkey Construction: 10 h
- test preparation Trades and Technology in Turnkey Construction: 20 h

total: 240 h

Recommendation
none

Literature
Literature Partielle Differential Equations:

- lecture notes
- lecture slides in Ilias realted to the course

Literature Introduction to Continuum Mechanics:

- Gross, D., Hauger, W., Wriggers, P.: Technische Mechanik IV. Springer, 2007
- Fung, Y.C.: A First Course in Continuum Mechanics. Rentice Hall, 1969
- Lai, M., Krempl, E., Rubin, D.: Introduction to Continuum Mechanics. Elsevier, 2010
- Reddy, J.N.: An Introduction to Continuum Mechanics - with Applications. Cambridge, 2008
- Prager, W.: Einführung in die Kontinuumsmechanik. Birkhäuser, 1961
- Becker, W., Gross, D.: Mechanik elastischer Körper und Strukturen. Springer, 2002
- Seelig, Th.: Einführung in die Kontinuumsmechanik. Skript zur Vorlesung
- Chou, P.C., Pagano, N.J.: Elasticity. Van Nostrand, 1967

Materials to Physical Modelling in Hydraulic Engineering:

- course-accompanying script
- slide copies and further learning material on the IWU homepage

Literature Life Cycle Management:

- lecture notes / corresponding literature will be presented in the course

Literature zu Introduction to Computer Programming II:

- S. Prata, “C++ Primer Plus”, Sams, 2005;
- J. Liberty and B. Jones, “Teach yourself C++ in 21 days”, Sams, 2005;
- R. Lischner, “C++ in a Nutshell”, O’Reilly, 2003;
- RRZN, “C++ für C Programmierer”, 2005 (Skriptenverkauf am SCC)

M 5.9 Module: Statics of Rigid Bodies (bauiBGP01-TM1) [M-BGU-101745]

Responsible: Prof. Dr.-Ing. Peter Betsch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Mechanics

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

Mandatory			
T-BGU-103377	Statics of Rigid Bodies	7 CR	Betsch

Competence Certificate
- 'Teilleistung' T-BGU-103377 with written examination according to § 4 Par. 2 No. 1, **part of the Orientation Examination according to § 8 Par. 1**

details about the learning control see at the 'Teilleistung'

Prerequisites
none

Competence Goal
The students can deal with the performance of structures using the model of rigid bodies. Relying on a few basic principles of physics, they can describe systems of rigid bodies starting from simple bodies and implement the procedure with engineering methods. They can apply the principle methodical approaches to the description of technical systems, especially of civil engineering structures.

Content

- operations with forces – force systems -method of sections
- equilibrium of coplanar/spatial force systems
- force systems, acting on bodies - resultants
- force couple - moments
- reduction of spatial force systems
- equilibrium of rigid bodies
- technical tasks – conventions for support and support conditions – statically determined support, equilibrium conditions
- centroid of an assemblage and of continuous quantities, distributed loads/area loads
- coplanar systems of rigid bodies – technical systems
- internal forces and moments
- ideal truss systems – buildup principle – Ritter’s method of sections
- section forces in beams – distribution of internal forces and moments – differential equation
- the principle of superposition
- friction stick and slip (static and kinetic) – belt friction
- work and energy - energy methods
- kinematics of coplanar motion – the principle of virtual work
- potential force, potential principles of work and energy
- stable and unstable equilibrium, stability

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, tutorial: 105 h

independent study:

- preparation and follow-up lectures, exercises: 45 h
- examination preparation: 60 h

total: 210 h

Recommendation
none

Literature
Gross / Hauger / Schröder Wall - Technische Mechanik 1

M 5.10 Module: Strength of Materials (bauiBGP02-TM2) [M-BGU-101746]

Responsible: Prof. Dr.-Ing. Thomas Seelig
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Mechanics

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

Mandatory			
T-BGU-103378	Strength of Materials	9 CR	Seelig

Competence Certificate
- 'Teilleistung' T-BGU-103378 with written examination according to § 4 Par. 2 No. 1

details about the learning control see at the 'Teilleistung'

Prerequisites
none

Competence Goal
Based on the knowledge of the statics of rigid bodies students can name the basic concepts of the strength of materials and elastostatics. They can describe states of stresses and strains and combine with material laws. Thereby, they can determine displacements under general loads built-up by tension/compression, bending, shear and torsion. Hence, they are able to compute even statically indeterminate structures. They are able to compute general systems by means of energy principles and to investigate the stability of elastic structures. The derivation and application is focused in civil engineering problems.

Content

- tension / compression in bars – stresses/ strains/constitutive equations
- differential equation for bar
- statically determinate and indeterminate problems
- combined stress state – stress vector/ stress tensor
- principle stresses – Mohr’s circle of stress – transformation of stresses and strains
- equilibrium conditions
- strain state, relation between stresses and strains – elastic materials
- yield and fracture criteria
- beam bending
- moments of inertia
- basic equations of pure bending
- normal stresses as the result of bending
- differential equations for beam bending
- single- and multi-field beam structures/superposition law
- shear stresses
- bending combined with normal force/skew bending unsymmetrical cross sections –
- torsion
- energy methods and deformation energy
- principle of virtual forces – truss systems, beam bending
- influence coefficients – Betti-Maxwell principle
- application of energy methods to statically indeterminate systems
- buckling

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, tutorial: 120 h

independent study:

- preparation and follow-up lectures, exercises: 60 h
- examination preparation: 90 h

total: 270 h

Recommendation
The module Statics of Rigid Bodies [bauiBGP01-TM1] shall be attended already.

Literature
Gross / Hauger / Schröder Wall - Technische Mechanik 2

M 5.11 Module: Dynamics (bauiBGP03-TM3) [M-BGU-101747]

Responsible: Prof. Dr.-Ing. Thomas Seelig
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Mechanics

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

Mandatory			
T-BGU-111041	Examination Prerequisite Dynamics	0 CR	Betsch, Seelig
T-BGU-103379	Dynamics	6 CR	Seelig

Competence Certificate
- 'Teilleistung' T-BGU-111041 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite
- 'Teilleistung' T-BGU-103379 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 deal with the principles, basic lwas and methods of the classical kinetics. They are able to to set up the equations of motion by means of the synthetic and the analytical method and to analyze the dynamical behavior of technical systems. They can describe vibration phenomenons and treat them mechanical-mathematically with the aid of the vibration theory.

Content

- kinematics of a single mass point (cartesian, polar and natural coordinates)
- kinetics of a single mass point: Newton’s fundamental law, equations of equilibrium, work-energy equation
- kinetics of mass point systems
- principle of linear momentum (impact law)
- plane relative motion - kinematics and kinetics of rigid bodies (moments of inertia, principle of angular momentum)
- systems of rigid bodies: synthetic and analytic (Lagrangian equations and approaches, constraints, the degree of freedom, potential and non-potential forces)
- introduction into linear vibration theory: mechanical models, free and focused vibrations of 1 DOF-systems, vibration of 2 DOF-systems
- relative motion

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, tutorial: 90 h

independent study:

- preparation and follow-up lectures, exercises: 45 h
- preparation of homeworks: 15 h
- examination preparation: 30 h

total: 180 h

Recommendation
the following modules should be attended already: Statics of Rigid Bodies [bauiBGP01-TM1], Strength of Material [bauiBGP02-TM2]

Literature
Gross / Hauger / Schröder Wall - Technische Mechanik 3

M 5.12 Module: Hydromechanics (bauiBGP04-HYDRO) [M-BGU-101748]

Responsible: Prof. Dr. Olivier Eiff
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Mechanics

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

Mandatory			
T-BGU-107586	Examination Prerequisite Hydromechanics	0 CR	Eiff
T-BGU-103380	Hydromechanics	6 CR	Eiff

Competence Certificate
- 'Teilleistung' T-BGU-107586 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite
- 'Teilleistung' T-BGU-103380 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 identify and explain the fundamental concepts and relations in fluid mechanics. They are able to apply these concepts and relations to solve simple fluid mechanical problems. In their professional lives, the students can effectively use an introductory textbook on fluid mechanics, such as the one proposed, to obtain estimates and find solutions for fluid-flow related problems, with confidence.

Content

- properties of fluids
- fluid statics: pressure distribution in stagnant fluids, buoyancy
- the Bernoulli equation
- flow kinematics: velocity and acceleration fields, control volumes, Reynolds transport theorem
- finite control volume analysis: conservation of mass, momentum and energy
- introduction to differential analysis of fluid flow
- dimensional analysis, similitude and modeling
- viscous flows in pipes
- flow over immersed bodies
- open-channel flows

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, tutorial: 90 h

independent study:

- preparation and follow-up lectures, exercises: 45 h
- preparation of homeworks: 15 h
- examination preparation: 30 h

total: 180 h

Recommendation
the following modules should be attended already:
Analysis and Linear Algebra [bauiBGP05-HM1]
Integration and Multivariate Analysis [bauiBGP06-HM2]
Statics of Rigid Bodies [bauiBGP01-TM1]

Literature

Munson, B.R., Okiishi, T.H. Huebsch, W. W., Rothmayer, A. P. (2010) Fluid Mechanics SI Version, 7th edition, Wiley.
Elger, D.F., LeBret, B.A., Crowe, C.T., Roberson, J.A. (2016) Engineering Fluid Mechanics, 11th edition, International Student Version, Wiley

M 5.13 Module: Analysis and Linear Algebra (bauiBGP05-HM1) [M-MATH-101716]

Responsible: Prof. Dr. Marlis Hochbruck
Organisation: KIT Department of Mathematics
Part of: Mathematics

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

Mandatory			
T-MATH-103325	Analysis and Linear Algebra - Exam	9 CR	Grimm, Hochbruck, Neher

Competence Certificate
- 'Teilleistung' T-MATH-103325 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):

- lecture, exercise, tutorial: 120 h

independent study:

- preparation and follow-up lectures, exercises: 60 h
- examination preparation: 90 h

total: 270 h

Recommendation
none

M 5.14 Module: Integration and Multivariate Analysis (bauiBGP06-HM2) [M-MATH-101714]

Responsible: Prof. Dr. Marlis Hochbruck
Organisation: KIT Department of Mathematics
Part of: Mathematics

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

Mandatory			
T-MATH-103324	Integration and Multivariate Analysis - Exam	9 CR	Grimm, Hochbruck, Neher

Competence Certificate
- 'Teilleistung' T-MATH-103324 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):

- lecture, exercise, tutorial: 120 h

independent study:

- preparation and follow-up lectures, exercises: 60 h
- examination preparation: 90 h

total: 270 h

Recommendation
none

M 5.15 Module: Applied Statistics (bauiBGP07-STATS) [M-BGU-101749]

Responsible: PD Dr. Frank Hase
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Mathematics

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

Mandatory			
T-BGU-103381	Applied Statistics	3 CR	Hase

Competence Certificate
- 'Teilleistung' T-BGU-103381 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 own basic understanding of the general principles and applications of statistical methods in the field of civil engineering. By this knowledge they can select appropriate statistical methods and evaluate their applicability for specific problems. They can run own calculations and interpret the results.

Content

- statistical analysis of random samples (statistical values and frequency distribution)
- description of the statistical population by probability density function
- selected probability density functions for discrete and continuous random variables
- confidence intervals and theory of testing
- two-dimensional probability density distribution and linear regression analysis

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: 30 h

independent study:

- preparation and follow-up lecture/exercises: 15 h
- examination preparation: 45 h

total: 90 h

Recommendation
none

Literature
Kreyszig, E.: Statistische Methoden und ihre Anwendung; Verlag Vandenhoeck und Ruprecht
Plate, E. (1993): Statistik und angewandte Wahrscheinlichkeitslehre für Bauingenieure, Verlag Ernst und Sohn, Berlin
Sachs, L. (1969): Statistische Auswertemethoden; Springer-Verlag

M 5.16 Module: Differential Equations (bauiBGP08-HM3) [M-MATH-101712]

Responsible: Prof. Dr. Marlis Hochbruck
Organisation: KIT Department of Mathematics
Part of: Mathematics

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

Mandatory			
T-MATH-103323	Differential Equations - Exam	4 CR	Grimm, Hochbruck, Neher

Competence Certificate
- 'Teilleistung' T-MATH-103323 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):

- lecture, exercise: 45 h

independent study:

- preparation and follow-up lectures, exercises: 30 h
- examination preparation: 45 h

total: 120 h

Recommendation
none

M 5.17 Module: Building Materials (bauiBGP09-BSTOF) [M-BGU-101750]

Responsible: Prof. Dr.-Ing. Frank Dehn
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Building Materials and Building Constructions

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

Mandatory			
T-BGU-103382	Theory of Building Materials	3 CR	Dehn
T-BGU-103383	Building Materials	9 CR	Dehn

Competence Certificate
- 'Teilleistung' T-BGU-103382 with written examination according to § 4 Par. 2 No. 1, **part of the Orientation Examination according to § 8 Par. 1**
- 'Teilleistung' T-BGU-103383 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 fundamental terms of material science and the specific properties of numerous building materials. They can describe the physical, chemical and mechanical relations, which result from the material structure and its time- and load-dependent modification. They are ableto explain the relationships between structure and properties of building materials. By using the learnt basic knowledge the students can name and describe methods of production, moulding, processing and protection of the durability of building materials. Furthermore, they can specify and evaluate the fundamentals for selecting applicable materials considering environmental aspects and sustainability as well as the building material phenomena by several examples from building practice.

Content
In this module the fundamental terms and principles of the atomic and textural structure and the essential mechanical and physical properties of building materials (e. g. steel, concrete, ceramics, glasses, polymers, timber, bituminous materials) are introduced. Especially the production and the source materials as well as their influence on the rheological, chemo-physical and mechanical properties of the building materials are in the focus of interest. Damage types and processes in connection with the durability of building materials are another essential part of the module. In addition the legal regulations regarding testing, supervision and certification of building materials are briefly introduced.

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

Annotation
none

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

- Theory of Building Materials lecture, exercise: 30 h
- Building Materials lecture, exercise: 90 h

independent study:

- preparation and follow-up lectures, exercises Theory of Building Materials: 15 h
- examination preparation Theory of Building Materials: 45 h
- preparation and follow-up lectures, exercises Building Materials: 60 h
- examination preparation Building Materials: 120 h

total: 360 h

Recommendation
none

Literature
lecture notes 'Baustoffkunde und Konstruktionsbaustoffe'

M 5.18 Module: Building Constructions (bauiBGP10-BKONS) [M-BGU-101751]

Responsible: Prof. Dr.-Ing. Frank Dehn
Prof. Dr.-Ing. Philipp Dietsch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Building Materials and Building Constructions

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

Mandatory			
T-BGU-103384	Building Physics	3 CR	Dehn
T-BGU-103386	Building Construction	6 CR	Dietsch, Steilner

Competence Certificate
- 'Teilleistung' T-BGU-103384 with written examination according to § 4 Par. 2 No. 1, **part of the Orientation Examination according to § 8 Par. 1**
- 'Teilleistung' T-BGU-103386 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 explain the normative requirements for building physics related aspects of a building as well as the associated analytical verifications. They can describe the physical aspects concerning heat protection, moisture protection, noise control and fire protection as well as the application of these physical relationships on structures and construction elements.

The students understand the basic requirements for buildings. They can define common construction methods, structural and bracing systems and describe the functional principle of typical structural elements and connections. They are able to determine loads and explain load transfer and the flow of forces in buildings. Based on the choice of structural elements, they are able to trace loads analytically to the foundation and verify simple structural elements, even under time pressure. The students are able to understand the protection objectives and basic principles of the building shell, to distinguish the main types of construction and functional principles of the foundation, the exterior walls, the ceiling and roof structure and to describe their respective properties and areas of application.

Content
Building Physics:

- heat and moisture transport processes
- thermal protection in winter and summer
- development of molds and condensation protection
- principles of noise control and fire protection in buildings

Building Construction:

The focus is on a physical, causal knowledge. Prior knowledge in mechanics and building physics is applied, supplemented by essential constructive aspects and placed in the context of building construction.

- requirements for buildings
- safety concept and loads
- construction methods, structural systems, structural elements, connections
- bracing systems
- basic principles of the building shell
- roof, ceiling and wall constructions
- foundations

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):

- Building Physics lecture, exercise: 30 h
- Building Construction lecture, exercise, tutorial: 90 h

independent study:

- preparation and follow-up lectures, exercises Building Physics: 15 h
- examination preparation Building Physics: 45 h
- preparation and follow-up lectures, exercises Building Construction: 15 h
- examination preparation Building Construction: 75 h

total: 270 h

Recommendation
none

Literature
lecture notes 'Building Physics'

Lutz, Jenisch, Klopfer et. al: Lehrbuch der Bauphysik. Schall, Wärme, Feuchte, Licht, Brand, Klima. Teubner Verlag

Hohmann, Setzer, Wehling: Bauphysikalische Formeln und Tabellen. Wärmeschutz, Feuchteschutz, Schallschutz. Werner Verlag

Gösele, Schüle, Künzel: Schall, Wärme, Feuchte. Grundlagen, neue Erkenntnisse und Ausführungshinweise für den Hochbau. Bauverlag

lecture notes (slides) 'Building Construction'. Annotations by the students are required.

Moro, J.L.: Baukonstruktion – vom Prinzip zum Detail, Springer Vieweg

Hestermann, Rongen: Frick/Knöll – Baukonstruktionslehre 1, Springer Vieweg

Dierks, Wormuth (Hrsg.): Baukonstruktion, Werner Verlag

Kuff, Schwalbenhofer, Strohm: Tragwerke: als Elemente der Gebäude- und Innenraumgestaltung, Springer Vieweg

Albert, Schneider (Hrsg.): Schneider Bautabellen für Ingenieure, Reguvis Verlag

M 5.19 Module: Basics in Engineering I (bauiBGP15-INGGL1) [M-BGU-103693]

Responsible: Prof. Dr.-Ing. Markus Uhlmann
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Basics in Engineering

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	pass/fail	Each winter term	2 terms	German	1	1

Mandatory			
T-BGU-107449	Project Management (not graded)	2 CR	Haghsheno
T-BGU-103395	Geology in Civil Engineering	2 CR	Blum, Menberg
T-BGU-103397	Programming Exercises Introduction to Computer Programming I	0 CR	Uhlmann
T-BGU-103396	Introduction to Computer Programming I	2 CR	Uhlmann

Competence Certificate
- 'Teilleistung' T-BGU-107449 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-103395 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-103397 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite to 'Teilleistung' T-BGU-103396
- 'Teilleistung' T-BGU-103396 with not graded accomplishment according to § 4 Par. 3

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

Prerequisites
none

Competence Goal
The students can explain the principles from several related disciplines in their importance for civil engineering. They can describe relationships and operating principles and apply them to simple problems in civil engineering.

They can explain central aspects of **project management**, such as project phases and project organization, using the example of construction projects. They will be able to describe the relationships between deadline management, cost management and quality management.

They will be able to name and apply basic terms from general and applied **geology** (engineering geology, hydrogeology and geothermics). They will be able to describe essential geological processes, interrelationships and working methods that are important for the construction industry and apply these to some extent.

Students gain a basic understanding of **digital data processing**. They are able to work independently on information processing problems and become acquainted with new computer applications. They are able to create their own computer programs.

Content
topics in Project Management:

- general organisation of projects, phases of projects
- time management, cost management and quality management
- specific conditions in construction projects

topics in Geology in Civil Engineering:

- shape and dynamics of the earth
- crystals, minerals, rocks and formations
- genesis and classification of soft and hard rock formations
- engineering geology
- building ground models
- hydrogeology
- geothermics

topics in Introduction to Computer Programming I:

- fundamentals of digital data processing: information and coding, data structures, algorithms, computer architectures
- introduction to programming: basic elements of high-level programming languages, structured programming, practical examples
- software applications: operating systems, selected software applications of interest for engineers

Module grade calculation
not graded

Annotation
none

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

- Project Management lecture/exercise: 30 h
- Geology in Civil Engineering lecture/exercise: 30 h
- Introduction to Computer Programming I lecture/exercise: 30 h

independent study:

- preparation and follow-up lecture/exercises Project Management: 10 h
- test preparation Project Management: 20 h
- preparation and follow-up lecture/exercises Geology in Civil Engineering: 10 h
- test preparation Geology in Civil Engineering: 20 h
- preparation of programming exercises Introduction to Computer Programming I: 15 h
- test preparation Introduction to Computer Programming I: 15 h

total: 180 h

Recommendation
none

Literature
Literature Project Management:

- DIETHELM, G.: Projektmanagement, Band 1: Grundlagen, Verlag Neue Wirtschafts-Briefe, Herne, 2000
- HAHN, R.: Projektmanagement für Ingenieure, Wiley-VCH Verlag, Weinheim, 2002
- KERZNER, H.: Project Management – A Systems Approach to Planning, Scheduling and Controlling, Wiley & Sons, 2006
- KOCHENDÖRFER, B., LIEBCHEN, J.: Bau-Projekt-Management, Verlag B. G. Teubner, Stuttgart, 2001

Literature Geology in Civil Engineering:

- Press, F. & Siever, R. (2017): Allgemeine Geologie, 7. Aufl., digital
- Prinz, H. & Strauß, R. (2011): Ingenieurgeologie. 5. Auflage, digital

Literature Introduction to Computer Programming I:

- J.G. Brookshear, “Computer Science: An Overview”, Pearson, 2009;
- B.W. Kernighan and D.M. Ritchie, “The C Programming Language”, Prentice Hall, 1988;
- S. Prata, “C++ Primer Plus”, Sams, 2005;
- J. Liberty and B. Jones, “Teach yourself C++ in 21 days”, Sams, 2005;
- RRZN, “Die Programmiersprache C”, 2008 (Skriptenverkauf am SCC)
- RRZN, “C++ für C Programmierer”, 2005 (Skriptenverkauf am SCC)

M 5.20 Module: Basics in Engineering II (bauiBGW8-INGGL2) [M-BGU-103694]

Responsible: N.N.
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Basics in Engineering

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	pass/fail	Each winter term	2 terms	German	1	2

Election notes
There are two not graded accomplishments of the offered courses to be taken.

Compulsory electives Basic Studies (Election: 2 items)			
T-BGU-107450	Planning Methodology	2 CR	Vortisch
T-BGU-103400	Chemistry of Building Materials	2 CR	Bogner, Thissen
T-BGU-103401	Environmental Physics / Energy	2 CR	Rodrigues Pereira da Franca
T-BGU-103403	Laboratory Course	2 CR	Vortisch
T-BGU-101683	Surveying for Civil Engineers and Geophysicists (ungraded)	2 CR	Rabold

Competence Certificate
Two of the listed learning controls have to taken. They can be selected freely.

- 'Teilleistung' T-BGU-107450 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-103400 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-103401 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-103403 with not graded accomplishment according to § 4 Par. 3
- 'Teilleistung' T-BGU-101683 with not graded accomplishment according to § 4 Par. 3

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

Prerequisites
none

Competence Goal
The students can explain the principles from selected related disciplines in their importance for civil engineering. They can describe interrelationships and working methods and apply them to simple problems in civil engineering.

if selecting **Planning Methodology**:
Students can explain the basic terms and procedures in planning processes using the example of spatial and transportation planning. They know the limits of technical planning and accept the decision-making authority of political bodies. They can deal with conflicts in an objective and moderating manner and distinguish between objective facts and subjective interests.

if selecting **Chemistry of Building Materials**:
Students can name and describe basic terms and relationships from general and inorganic chemistry as well as special relationships related to the construction industry. They are able to apply the relationships to simple questions.

if selecting **Environmental Physics / Energy**:
Students are able to describe environmental phenomena and explain their use in terms of energy production.

if selecting **Laboratory Course**:
Students can carry out laboratory experiments and take scientific principles into account. They can apply the measurement methods used in the selected experiments and are able to analyze, describe and critically question measurement results.

if selecting **Surveying**:
Students can name and describe the most important geodetic methods and the most frequently used instruments. They are able to apply these in a detailed survey.

Content
in accordance to the selected courses:

Planning Methodology, planning methods:

- planning principles
- planning model traffic
- conflicts of interest and perception
- forecasting methods

Chemistry of Building Materials, specific scientific principles:

- composition and structures of materials
- chemical bonds
- construction binding agent
- damage mechanisms in building materials

Environmental Physics / Energy, specific scientific principles:

- concept of energy, energy balances
- renewable and non-renewable energy sources and natural resources
- power generation: hydropower, wind energy, solar energy, geothermal power plants
- transport phenomena in the environment, physics of the atmosphere
- presentation of current research projects at KIT

Laboratory Course, measurement and analysis methods; experiments on topics in all focus areas:

- Structural Engineering
- Water and Environment
- Mobility and Infrastructure
- Technology and Management in Construction
- Geotechnical Engineering

Surveying, measurement and analysis methods:

- organization of surveying
- reference frames (local and international) coordinate systems (e.g. UTM, Gauss-Krüger)
- elevation determination
- position determination
- basic geodetic calculations

Module grade calculation
not graded

Annotation
none

Workload
contact hours (1 HpW = 1 h x 15 weeks), depending on the selected course:

- Planning Methodology lecture/exercise: 30 h
- Chemistry of Building Materials lecture: 30 h
- Environmental Physics / Energy lecture: 30 h
- Laboratory Course, conduction of 4 experiments (2 x 4 h each): 32 h
- Surveying lecture, exercise: 30 h

independent study, depending on the selected course:

- preparation and follow-up lecture/exercises Planning Methodology: 15 h
- test preparation Planning Methodology: 15 h
- preparation and follow-up lectures Chemistry of Building Materials: 15 h
- test preparation Chemistry of Building Materials: 15 h
- preparation and follow-up lectures Environmental Physics / Energy, preparation of exercises (not graded accomplishment): 30 h
- reporting experiments Laboratory Course (not graded accomplishment): 24 h
- preparation and follow-up lectures, exercises Surveying: 20 h
- preparation group calculation exercises (not graded accomplishment): 10 h

total: 120 h

Recommendation
none

Literature
Literature Planning Methodology:

- lecture notes
- Fürst, D.; Scholles, F. (Hrsg.) 2008: Handbuch Theorien und Methoden der Raum- und Umweltplanung; Detmold: Dorothea Rohn

Literature Chemistry of Building Materials:

- Erwin Riedel und Hans-Jürgen Meyer (2019), Allgemeine und Anorganische Chemie, De Gruyter Verlag

M 5.21 Module: Module Bachelor's Thesis (bauiBSC-THESIS) [M-BGU-103764]

Responsible: Studiendekan:in der KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Bachelor's Thesis

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
12	Grade to a tenth	Each term	1 term	German/English	3	2

Mandatory			
T-BGU-107601	Bachelor's Thesis	12 CR	Vortisch

Competence Certificate
- 'Teilleistung' T-BGU-107601 with thesis and presentation according to § 14

details about the learning control see at the 'Teilleistung'

Prerequisites
Prerequisite for the admission to the module Bachelor Thesis is that the student has passed all module examinations from the Basic Studies according to § 20 Paragraph 2 in extent of 90 CP and module examinations of the Basic Subject Studies according to § 20 Paragraph 3 in extent of 30 CP. The examination committee decides about exceptions by request of the student (§14 Par. 1).

Modeled Conditions
The following conditions have to be fulfilled:

1. The following conditions have to be fulfilled:
    1. The field Mechanics must have been passed.
    2. The field Mathematics must have been passed.
    3. The field Building Materials and Building Constructions must have been passed.
    4. The field Basics in Engineering must have been passed.
    5. The field Interdisciplinary Qualifications must have been passed.
2. You need to have earned at least 120 credits in your course of studies.

Competence Goal
The student is able to investigate a complex problem within a particular 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 compare them with the state of the art. He is further able to represent clearly the essential matter and results in his bachelor thesis.

Content
The Bachelor Thesis is a first major written report and comprises the theoretical or experimental treatise of a complex problem within a particular field of civil engineering with scientific methods. The student chooses a particular field and can make proposals for the theme.

Module grade calculation
The grade of the module results from the grades of the Bachelor Thesis and the concluding presentation.

Annotation
information about the procedure regarding admission and registration of the Bachelor Thesis see chap. 2.7.

Workload
appr. 2 months net within a period of 3 months

Recommendation
none

M 5.22 Module: Interdisciplinary Qualifications (bauiBW0-UEQUAL) [M-BGU-103854]

Responsible: Studiendekan:in der KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften
Organisation: University
Part of: Interdisciplinary Qualifications

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	pass/fail	Each term	2 terms	German	3	2

Election notes
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. 2.8). Title and CP of the taken exam are taken over by the assignment.

Interdisciplinary Qualifications (Election: at least 6 credits)			
T-BGU-111460	Self Assignment HoC-ZAK-SpZ 1 not graded	2 CR	
T-BGU-111461	Self Assignment HoC-ZAK-SpZ 2 not graded	2 CR	
T-BGU-111462	Self Assignment HoC-ZAK-SpZ 3 not graded	2 CR	
T-BGU-112819	Self Assignment HoC-ZAK-SpZ 7 not graded	2 CR	
T-BGU-111463	Self Assignment HoC-ZAK-SpZ 4 graded	2 CR	
T-BGU-111464	Self Assignment HoC-ZAK-SpZ 5 graded	2 CR	
T-BGU-111465	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 recognize further suitable courses as Interdisciplinary Qualifications which are not listed in the mentioned offers of Hoc, ZAK and 'Sprachenzentrum' (SpZ, Language Centre). By this, interdisciplinary qualifications obtained in an internship can be recognized with CPs by means of respective certification. Further information about the Interdisciplinary Qualifications (selection, registration, etc.) see Sect. 2.8 (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 5.23 Module: Further Examinations (bauiBZL) [M-BGU-103857]

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

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
30	pass/fail	Each term	2 terms	German	3	4

Additional Examinations (Election: at most 30 credits)			
T-BGU-107450	Planning Methodology	2 CR	Vortisch
T-BGU-103400	Chemistry of Building Materials	2 CR	Bogner, Thissen
T-BGU-103401	Environmental Physics / Energy	2 CR	Rodrigues Pereira da Franca
T-BGU-103403	Laboratory Course	2 CR	Vortisch
T-BGU-101683	Surveying for Civil Engineers and Geophysicists (ungraded)	2 CR	Rabold
T-MATH-103326	Partial Differential Equations - Exam	2 CR	Grimm, Hochbruck, Neher
T-BGU-107466	Introduction to Continuum Mechanics (not graded)	2 CR	Seelig
T-BGU-107467	Physical Modelling in Hydraulic Engineering	2 CR	Seidel
T-BGU-107469	Project 'Plan, Design, Engineering'	2 CR	Vortisch
T-BGU-107470	Life Cycle Management	2 CR	Dehn, Lennerts
T-BGU-103399	Programming Exercises Introduction to Computer Programming II	0 CR	Uhlmann
T-BGU-103398	Introduction to Computer Programming II	2 CR	Uhlmann
T-BGU-107473	Computer Aided Design (CAD)	2 CR	Haghsheno
T-BGU-108942	Engineering Hydrology (not graded)	2 CR	Ehret
T-BGU-110821	Trades and Technology in Turnkey Construction	2 CR	Haghsheno

Prerequisites
None

Annotation
IMPORTANT:
As from winter term 2023/24 Technical Illustration will not be offered any more.

M 5.24 Module: Supplementary Studies on Culture and Society [M-ZAK-106235]

Responsible: Dr. Christine Mielke
Christine Myglas

Organisation:

Part of: Additional Accomplishments (Usage from 4/1/2023)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
22	Grade to a tenth	Each term	3 terms	German	3	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 examantion 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 1Technology & Responsibility

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

Block 2Doing Culture

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

Block 3Media & Aesthetics

Media communication, cultural aesthetics

Block 4Spheres of Life

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

Block 5Global 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 5.25 Module: Supplementary Studies on Sustainable Development [M-ZAK-106099]

Responsible: Dr. Christine Mielke
Christine Myglas

Organisation:

Part of: Additional Accomplishments (Usage from 4/1/2023)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
19	Grade to a tenth	Each term	3 terms	German	3	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 examantion 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: Analysis and Linear Algebra - Exam [T-MATH-103325]

Responsible: PD Dr. Volker Grimm
Prof. Dr. Marlis Hochbruck
PD Dr. Markus Neher

Organisation: KIT Department of Mathematics

Part of: M-MATH-101716 - Analysis and Linear Algebra

Type	Credits	Grading scale	Recurrence	Version
Written examination	9	Grade to a third	Each term	1

Events					
WT 23/24	0131900	Advanced Mathematics 1 for the Functional Direction Civil Engineering: Analysis and Linear Algebra	4 SWS	Lecture / 🗣	Neher
WT 23/24	0132000	Practice to Advanced Mathematics 1 for the Functional Direction Civil Engineering: Analysis and Linear Algebra	2 SWS	Practice / 🗣	Neher
WT 23/24	0132100	Supplement to Advanced Mathematics 1 for the Functional Direction Civil Engineering: Analysis and Linear Algebra	1 SWS	Lecture / 🗣	Neher

Legend: 🖥 Online, 🌸 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
written exam, 90 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.2 Course: Applied Statistics [T-BGU-103381]

Responsible: PD Dr. Frank Hase
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101749 - Applied Statistics

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each term	1

Events					
ST 2024	6200204	Applied Statistics	2 SWS	Lecture / Practice (/	Hase

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written exam, 60 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.3 Course: Bachelor's Thesis [T-BGU-107601]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103764 - Module Bachelor's Thesis

Type	Credits	Grading scale	Recurrence	Version
Final Thesis	12	Grade to a third	Each term	1

Competence Certificate
thesis with a duration of 3 months and final presentation, according to § 14

Prerequisites
defined for the module Bachelor Thesis [M-BGU-103764]

Final Thesis
This course represents a final thesis. The following periods have been supplied:

Submission deadline	3 months
Maximum extension period	1 months
Correction period	6 weeks

Recommendation
none

Annotation
information about the procedure regarding admission and registration of the Bachelor Thesis see chap. 2.7.

T 6.4 Course: Basics in Foundation Engineering [T-BGU-112815]

Responsible: Prof. Dr.-Ing. Hans Henning Stutz
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103698 - Geotechnical Engineering

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	5,5	Grade to a third	Each term	1 terms	1

Events					
WT 23/24	6200515	Basics in Foundation Engineering	2 SWS	Lecture /	Stutz
WT 23/24	6200516	Exercises to Basics of Foundation Engineering	2 SWS	Practice /	Mitarbeiter/innen
WT 23/24	6200517	Tutorial to Basics in Foundation Engineering	2 SWS	Tutorial (/	Mitarbeiter/innen

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written exam, 75 min.

Prerequisites
The module examinations in den subjects Mechanics and Mathematics as well as the module examination Building Construction has to be passed all except two.

Modeled Conditions
You have to fulfill 7 of 9 conditions:

1. The module M-BGU-101745 - Statics of Rigid Bodies must have been passed.
2. The module M-BGU-101746 - Strength of Materials must have been passed.
3. The module M-BGU-101747 - Dynamics must have been passed.
4. The module M-BGU-101748 - Hydromechanics must have been passed.
5. The module M-MATH-101716 - Analysis and Linear Algebra must have been passed.
6. The module M-MATH-101714 - Integration and Multivariate Analysis must have been passed.
7. The module M-BGU-101749 - Applied Statistics must have been passed.
8. The module M-MATH-101712 - Differential Equations must have been passed.
9. The module M-BGU-101751 - Building Constructions must have been passed.

Recommendation
Taking the examination Basics in Foundation Engineering after taking the examination Basics in Soil Mechanics is highly recommended.

Annotation
none

T 6.5 Course: Basics in Soil Mechanics [T-BGU-112814]

Responsible: Prof. Dr.-Ing. Hans Henning Stutz
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103698 - Geotechnical Engineering

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	5,5	Grade to a third	Each term	1 terms	1

Events					
ST 2024	6200415	Basics in Soil Mechanics	2 SWS	Lecture / 🗣	Stutz
ST 2024	6200416	Exercises to Basics in Soil Mechanics	2 SWS	Practice / 🗣	Mitarbeiter/innen
ST 2024	6200417	Tutorials to Basics in Soil Mechanics	2 SWS	Tutorial (/ 🗣	Mitarbeiter/innen

Legend: 🖥 Online, 🖥🗣 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
written exam, 75 min.

Prerequisites
The module examinations in den subjects Mechanics and Mathematics as well as the module examination Building Construction has to be passed all except two.

Modeled Conditions
You have to fulfill 7 of 9 conditions:

1. The module M-BGU-101745 - Statics of Rigid Bodies must have been passed.
2. The module M-BGU-101746 - Strength of Materials must have been passed.
3. The module M-BGU-101747 - Dynamics must have been passed.
4. The module M-BGU-101748 - Hydromechanics must have been passed.
5. The module M-MATH-101716 - Analysis and Linear Algebra must have been passed.
6. The module M-MATH-101714 - Integration and Multivariate Analysis must have been passed.
7. The module M-BGU-101749 - Applied Statistics must have been passed.
8. The module M-MATH-101712 - Differential Equations must have been passed.
9. The module M-BGU-101751 - Building Constructions must have been passed.

Recommendation
Taking the examination Basics in Soil Mechanics before taking the examination Basics in Foundation Engineering is highly recommended.

Annotation
none

T 6.6 Course: Basics in Steel Structures [T-BGU-107462]

Responsible: Prof. Dr.-Ing. Thomas Ummenhofer
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103697 - Basics in Steel and Timber Structures

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each term	1

Events					
WT 23/24	6200504	Grundlagen des Stahlbaus	2 SWS	Lecture	Ummenhofer
WT 23/24	6200505	Übungen zu Grundlagen des Stahlbaus	1 SWS	Practice	Ummenhofer, Mitarbeiter/innen

Competence Certificate
written exam, 90 min.

Prerequisites
The module examinations in den subjects Mechanics and Mathematics as well as the module examination Building Construction has to be passed all except two.

Modeled Conditions
You have to fulfill 7 of 9 conditions:

1. The module M-BGU-101745 - Statics of Rigid Bodies must have been passed.
2. The module M-BGU-101746 - Strength of Materials must have been passed.
3. The module M-BGU-101747 - Dynamics must have been passed.
4. The module M-BGU-101748 - Hydromechanics must have been passed.
5. The module M-MATH-101716 - Analysis and Linear Algebra must have been passed.
6. The module M-MATH-101714 - Integration and Multivariate Analysis must have been passed.
7. The module M-BGU-101749 - Applied Statistics must have been passed.
8. The module M-MATH-101712 - Differential Equations must have been passed.
9. The module M-BGU-101751 - Building Constructions must have been passed.

Recommendation
none

Annotation
none

T 6.7 Course: Basics in Timber Structures [T-BGU-107463]

Responsible: Prof. Dr.-Ing. Philipp Dietsch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103697 - Basics in Steel and Timber Structures

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each term	1

Events					
WT 23/24	6200507	Grundlagen des Holzbaus	2 SWS	Lecture	Dietsch, Mitarbeiter/innen
WT 23/24	6200508	Übungen zu Grundlagen des Holzbaus	1 SWS	Practice	Mitarbeiter/innen

Competence Certificate
written exam, 90 min.

Prerequisites
The module examinations in den subjects Mechanics and Mathematics as well as the module examination Building Construction has to be passed all except two.

Modeled Conditions
You have to fulfill 7 of 9 conditions:

1. The module M-BGU-101745 - Statics of Rigid Bodies must have been passed.
2. The module M-BGU-101746 - Strength of Materials must have been passed.
3. The module M-BGU-101747 - Dynamics must have been passed.
4. The module M-BGU-101748 - Hydromechanics must have been passed.
5. The module M-MATH-101716 - Analysis and Linear Algebra must have been passed.
6. The module M-MATH-101714 - Integration and Multivariate Analysis must have been passed.
7. The module M-BGU-101749 - Applied Statistics must have been passed.
8. The module M-MATH-101712 - Differential Equations must have been passed.
9. The module M-BGU-101751 - Building Constructions must have been passed.

Recommendation
none

Annotation
none

T 6.8 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 stdues
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 6.9 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 stdues
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
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 6.10 Course: Basics of Reinforced Concrete I [T-BGU-103389]

Responsible: Prof. Dr.-Ing. Alexander Stark
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103696 - Basics of Reinforced Concrete

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each term	1

Events					
WT 23/24	6200509	Grundlagen des Stahlbetonbaus I	2 SWS	Lecture / 🗣	Stark
WT 23/24	6200510	Übungen zu Grundlagen des Stahlbetonbaus I	1 SWS	Practice	Mitarbeiter/innen

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
written exam, 90 min.

Prerequisites
The module examinations in den subjects Mechanics and Mathematics as well as the module examination Building Construction has to be passed all except two.

Modeled Conditions
You have to fulfill 7 of 9 conditions:

1. The module M-BGU-101745 - Statics of Rigid Bodies must have been passed.
2. The module M-BGU-101746 - Strength of Materials must have been passed.
3. The module M-BGU-101747 - Dynamics must have been passed.
4. The module M-BGU-101748 - Hydromechanics must have been passed.
5. The module M-MATH-101716 - Analysis and Linear Algebra must have been passed.
6. The module M-MATH-101714 - Integration and Multivariate Analysis must have been passed.
7. The module M-BGU-101749 - Applied Statistics must have been passed.
8. The module M-MATH-101712 - Differential Equations must have been passed.
9. The module M-BGU-101751 - Building Constructions must have been passed.

Recommendation
none

Annotation
none

T 6.11 Course: Basics of Reinforced Concrete II [T-BGU-103390]

Responsible: Prof. Dr.-Ing. Alexander Stark
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103696 - Basics of Reinforced Concrete

Type	Credits	Grading scale	Recurrence	Version
Written examination	2	Grade to a third	Each term	1

Events					
ST 2024	6200601	Basics of Reinforced Concrete II	2 SWS	Lecture / Practice (/	Stark

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written exam, 60 min.

Prerequisites
The module examinations in den subjects Mechanics and Mathematics as well as the module examination Building Construction has to be passed all except two.

Modeled Conditions
You have to fulfill 7 of 9 conditions:

1. The module M-BGU-101745 - Statics of Rigid Bodies must have been passed.
2. The module M-BGU-101746 - Strength of Materials must have been passed.
3. The module M-BGU-101747 - Dynamics must have been passed.
4. The module M-BGU-101748 - Hydromechanics must have been passed.
5. The module M-MATH-101716 - Analysis and Linear Algebra must have been passed.
6. The module M-MATH-101714 - Integration and Multivariate Analysis must have been passed.
7. The module M-BGU-101749 - Applied Statistics must have been passed.
8. The module M-MATH-101712 - Differential Equations must have been passed.
9. The module M-BGU-101751 - Building Constructions must have been passed.

Recommendation
none

Annotation
none

T 6.12 Course: Building Construction [T-BGU-103386]

Responsible: Prof. Dr.-Ing. Philipp Dietsch
Michael Steilner
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101751 - Building Constructions

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each term	1

Events					
WT 23/24	6200310	Baukonstruktionslehre	2 SWS	Lecture /	Dietsch, Steilner
WT 23/24	6200311	Übungen zu Baukonstruktionslehre	2 SWS	Practice /	Mitarbeiter/innen, Steilner
WT 23/24	6200312	Tutorien zu Baukonstruktionslehre	2 SWS	Tutorial (	Steilner

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written exam, 90 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.13 Course: Building Materials [T-BGU-103383]

Responsible: Prof. Dr.-Ing. Frank Dehn
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101750 - Building Materials

Type	Credits	Grading scale	Recurrence	Version
Written examination	9	Grade to a third	Each term	1

Events					
WT 23/24	6200307	Konstruktionsbaustoffe	4 SWS	Lecture / 🗣	Dehn
WT 23/24	6200308	Übungen zu Konstruktionsbaustoffe	2 SWS	Practice / 🗣	Dehn, Assistenten

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
written exam, 120 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.14 Course: Building Physics [T-BGU-103384]

Responsible: Prof. Dr.-Ing. Frank Dehn
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101751 - Building Constructions

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each term	1

Events					
ST 2024	6200208	Building Physics	1 SWS	Lecture /	Dehn
ST 2024	6200209	Exercises to Building Physics	1 SWS	Practice /	Mitarbeiter/innen

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written exam, 60 min.

part of the Orientation Examination according to § 8 Par. 1, to be taken until the end of the examination period of the 2nd semester

Prerequisites
none

Recommendation
none

Annotation
none

T 6.15 Course: Chemistry of Building Materials [T-BGU-103400]

Responsible: Dr. rer. nat. Andreas Bogner
Dr. Peter Thissen

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

Part of: M-BGU-103694 - Basics in Engineering II
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each term	1

Events					
WT 23/24	6200108	Bauchemie	2 SWS	Lecture / 🗣	Bogner, Thissen

Legend: 💻 Online, 🎭 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
written test, 30 min.

Prerequisites
none

Recommendation
none

Annotation
Literature:

Erwin Riedel: Allgemeine und Anorganische Chemie, Gruyter Verlag

T 6.16 Course: Computer Aided Design (CAD) [T-BGU-107473]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103695 - Supplements in Engineering
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each winter term	1

Events					
WT 23/24	6200520	Computer Aided Design (CAD)	2 SWS	Lecture / Practice (	Haghsheno

Competence Certificate
Creation of a three-dimensional building model and associated CAD plans.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.17 Course: Differential Equations - Exam [T-MATH-103323]

Responsible: PD Dr. Volker Grimm
Prof. Dr. Marlis Hochbruck
PD Dr. Markus Neher

Organisation: KIT Department of Mathematics

Part of: M-MATH-101712 - Differential Equations

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each term	1

Events					
WT 23/24	0132200	Advanced Mathematics III for the Functional Direction Civil Engineering: Differential equations	2 SWS	Lecture /	Grimm
WT 23/24	0132300	Exercices to Advanced Mathematics III for the Functional Direction Civil Engineering: Differential equations	1 SWS	Practice /	Grimm

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written exam, 60 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.18 Course: Dynamics [T-BGU-103379]

Responsible: Prof. Dr.-Ing. Thomas Seelig
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101747 - Dynamics

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each term	2

Events					
WT 23/24	6200301	Dynamik	2 SWS	Lecture / 🗣	Seelig
WT 23/24	6200302	Übungen zu Dynamik	2 SWS	Practice / 🗣	Helbig
WT 23/24	6200303	Tutorien zu Dynamik	2 SWS	Tutorial (/ 🗣	Mitarbeiter/innen

Legend: 💻 Online, 🗣 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
written exam, 100 min.

Prerequisites
The Examination Prerequisite Dynamics (T-BGU-111041) has to be passed.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-BGU-111041 - Examination Prerequisite Dynamics must have been passed.

Recommendation
none

Annotation
none

T 6.19 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 stdues
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
The content of the Basics Module is helpful.

T 6.20 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 stdues
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
The content of the Basics Module is helpful.

T 6.21 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 stdues
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
The content of the Basics Module is helpful.

T 6.22 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 stdues
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
The content of the Basics Module is helpful.

T 6.23 Course: Engineering Hydrology (not graded) [T-BGU-108942]

Responsible: PD Dr.-Ing. Uwe Ehret
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103695 - Supplements in Engineering
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each summer term	1

Events					
ST 2024	6200617	Engineering Hydrology	2 SWS	Lecture / Practice (/	Ehret

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written test, 60 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.24 Course: Environmental Physics / Energy [T-BGU-103401]

Responsible: Prof. Dr. Mario Jorge Rodrigues Pereira da Franca
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103694 - Basics in Engineering II
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each winter term	1

Events					
WT 23/24	6200112	Umweltphysik / Energie	2 SWS	Lecture	Valero Huerta, Rodrigues Pereira da Franca

Competence Certificate
attested exercises

Prerequisites
none

Recommendation
none

Annotation
none

T 6.25 Course: Examination Prerequisite Dynamics [T-BGU-111041]

Responsible: Prof. Dr.-Ing. Peter Betsch
Prof. Dr.-Ing. Thomas Seelig
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101747 - Dynamics

Type	Credits	Grading scale	Recurrence	Expansion	Version
Completed coursework	0	pass/fail	Each winter term	1 terms	1

Events					
WT 23/24	6200301	Dynamik	2 SWS	Lecture /	Seelig
WT 23/24	6200302	Übungen zu Dynamik	2 SWS	Practice /	Helbig
WT 23/24	6200303	Tutorien zu Dynamik	2 SWS	Tutorial (/	Mitarbeiter/innen

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
preparation of 3 exercises

Prerequisites
none

Recommendation
none

Annotation
none

T 6.26 Course: Examination Prerequisite Hydromechanics [T-BGU-107586]

Responsible: Prof. Dr. Olivier Eiff
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101748 - Hydromechanics

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each winter term	1

Events					
WT 23/24	6200304	Hydromechanik	2 SWS	Lecture / 🗣	Eiff
WT 23/24	6200305	Übungen zu Hydromechanik	2 SWS	Practice / 🗣	Dupuis
WT 23/24	6200306	Tutorien zu Hydromechanik	2 SWS	Tutorial (/ 🗣	Eiff, Dupuis, Tutoren

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
preparation of 3 exercises

Prerequisites
none

Recommendation
none

Annotation
none

T 6.27 Course: Geology in Civil Engineering [T-BGU-103395]

Responsible: Prof. Dr. Philipp Blum
Dr. Kathrin Menberg
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103693 - Basics in Engineering I

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each term	1

Events					
ST 2024	6340101	Geology in Construction	2 SWS	Lecture / Practice (/	Blum, Menberg, Fuchs

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written test, 20 min.

Prerequisites
none

Recommendation
none

Annotation
Literature:

Press, F. & Siever, R. (2017): Allgemeine Geologie, 7. Aufl., digital
Prinz, H. & Strauß, R. (2011): Ingenieurgeologie. 5. Auflage, digital

T 6.28 Course: Hydromechanics [T-BGU-103380]

Responsible: Prof. Dr. Olivier Eiff
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101748 - Hydromechanics

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each term	1

Events					
WT 23/24	6200304	Hydromechanik	2 SWS	Lecture / 🗣	Eiff
WT 23/24	6200305	Übungen zu Hydromechanik	2 SWS	Practice / 🗣	Dupuis
WT 23/24	6200306	Tutorien zu Hydromechanik	2 SWS	Tutorial (/ 🗣	Eiff, Dupuis, Tutoren

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written exam, 100 min.

Prerequisites
The Examination Prerequisite Hydromechanics (T-BGU-107586) has to be passed.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-BGU-107586 - Examination Prerequisite Hydromechanics must have been passed.

Recommendation
none

Annotation
none

T 6.29 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 stdues
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

Annotation
The content of the Basic Modul is helpful.

T 6.30 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 stdues
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

Annotation
The content of the Basic Modul is helpful.

T 6.31 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 stdues
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

Annotation
The content of the Basic Modul is helpful.

T 6.32 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 stdues
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

Annotation
The content of the Basic Modul is helpful.

T 6.33 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 stdues
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

Annotation
The content of the Basic Modul is helpful.

T 6.34 Course: Integration and Multivariate Analysis - Exam [T-MATH-103324]

Responsible: PD Dr. Volker Grimm
Prof. Dr. Marlis Hochbruck
PD Dr. Markus Neher

Organisation: KIT Department of Mathematics

Part of: M-MATH-101714 - Integration and Multivariate Analysis

Type	Credits	Grading scale	Recurrence	Version
Written examination	9	Grade to a third	Each term	1

Events					
ST 2024	0181300	Advanced Mathematics 2 for the Functional Direction Civil Engineering: Differential and Integral Calculus	4 SWS	Lecture	Neher
ST 2024	0181400	Practice to Advanced Mathematics 2 for the Functional Direction Civil Engineering: Differential and Integral Calculus	2 SWS	Practice	Neher

Competence Certificate
written exam, 90 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.35 Course: Introduction to Computer Programming I [T-BGU-103396]

Responsible: Prof. Dr.-Ing. Markus Uhlmann
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103693 - Basics in Engineering I

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each term	1

Events					
WT 23/24	6200114	Bauinformatik I	1 SWS	Lecture /	Uhlmann, Scherer
WT 23/24	6200115	Übungen zu Bauinformatik I	1 SWS	Practice /	Uhlmann

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written test, 30 min.

Prerequisites
The accomplishment 'Programming Exercises Introduction to Computer Programming I' (T-BGU-103397) has to be passed.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-BGU-103397 - Programming Exercises Introduction to Computer Programming I must have been passed.

Recommendation
none

Annotation
Literature/Materials:

J.G. Brookshear, “Computer Science: An Overview”, Pearson, 2009;
B.W. Kernighan and D.M. Ritchie, “The C Programming Language”, Prentice Hall, 1988;
S. Prata, “C++ Primer Plus”, Sams, 2005;
J. Liberty and B. Jones, “Teach yourself C++ in 21 days”, Sams, 2005;
RRZN, “Die Programmiersprache C”, 2008 (Skriptenverkauf am SCC)
RRZN, “C++ für C Programmierer”, 2005 (Skriptenverkauf am SCC)

T 6.36 Course: Introduction to Computer Programming II [T-BGU-103398]

Responsible: Prof. Dr.-Ing. Markus Uhlmann
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103695 - Supplements in Engineering
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each summer term	1

Events					
ST 2024	6200422	Construction Informatics II	1 SWS	Lecture /	Uhlmann
ST 2024	6200423	Exercises Construction Informatics II	1 SWS	Practice /	Uhlmann

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written test, 30 min.

Prerequisites
The accomplishment 'Programming Exercises Introduction to Computer Programming II' (T-BGU-103399) has to be passed.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-BGU-103399 - Programming Exercises Introduction to Computer Programming II must have been passed.

Recommendation
none

Annotation
Literature/learning materials:

S. Prata, "C++ Primer Plus", Sams, 2005;
J. Liberty and B. Jones, "Teach yourself C++ in 21 days", Sams, 2005;
R. Lischner, "C++ in a Nutshell", O'Reilly, 2003;
RRZN, "C++ für C Programmierer", 2005 (script sales at SCC)

T 6.37 Course: Introduction to Continuum Mechanics (not graded) [T-BGU-107466]

Responsible: Prof. Dr.-Ing. Thomas Seelig
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103695 - Supplements in Engineering
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each summer term	2

Events					
ST 2024	6200421	Introduction to Continuum Mechanics	2 SWS	Lecture / 🗣	Helbig

Legend: 💻 Online, 🎲 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
oral test, appr. 20 min.

Prerequisites
none

Recommendation
none

Annotation
Literature:

Gross, D., Hauger, W., Wriggers, P.: Technische Mechanik IV. Springer, 2007
Fung, Y.C.: A First Course in Continuum Mechanics. Rentice Hall, 1969
Lai, M., Krempl, E., Rubin, D.: Introduction to Continuum Mechanics. Elsevier, 2010
Reddy, J.N.: An Introduction to Continuum Mechanics - with Applications. Cambridge, 2008
Prager, W.: Einführung in die Kontinuumsmechanik. Birkhäuser, 1961
Becker, W., Gross, D.: Mechanik elastischer Körper und Strukturen. Springer, 2002
Seelig, Th.: Einführung in die Kontinuumsmechanik. Skript zur Vorlesung
Chou, P.C., Pagano, N.J.: Elasticity. Van Nostrand, 1967

T 6.38 Course: Laboratory Course [T-BGU-103403]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103694 - Basics in Engineering II
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each winter term	1

Events					
WT 23/24	6200118	Laborpraktikum		Practical course / 🗣	Vortisch, Mitarbeiter/innen

Legend: 💻 Online, 🖧 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
reports (appr. 2-4 pages each) to 4 experiments at 4 selected institutes

Prerequisites
none

Recommendation
none

Annotation
none

T 6.39 Course: Life Cycle Management [T-BGU-107470]

Responsible: Prof. Dr.-Ing. Frank Dehn
Prof. Dr.-Ing. Kunibert Lennerts

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

Part of: M-BGU-103695 - Supplements in Engineering
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each summer term	1

Events					
ST 2024	6200615	Life Cycle Management	2 SWS	Lecture / Practice (/	Lennerts, Dehn, Vogel

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written test, 60 min.

Prerequisites
none

Recommendation
none

Annotation
Literature:

lecture notes / corresponding literature will be presented in the course

T 6.40 Course: Mobility and Infrastructure [T-BGU-101791]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103486 - Mobility and Infrastructure

Type	Credits	Grading scale	Recurrence	Version
Written examination	12	Grade to a third	Each term	2

Events					
ST 2024	6200404	Spatial Planning and Planning Law	2 SWS	Lecture /	Wilske
ST 2024	6200405	Exercises to Spatial Planning and Planning Law	1 SWS	Practice /	Wilske, Mitarbeiter/ innen
ST 2024	6200406	Transportation Systems	2 SWS	Lecture /	Vortisch
ST 2024	6200407	Exercises to Transportation Systems		Practice /	Vortisch, Mitarbeiter/ innen
ST 2024	6200408	Design Basics in Highway Engineering	2 SWS	Lecture /	Plachkova-Dzhurova, Zimmermann
ST 2024	6200409	Exercises to Design Basics in Highway Engineering		Practice /	Plachkova-Dzhurova, Zimmermann

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written exam, 150 min.

Prerequisites
the 'Term papers Transportation' (T-BGU-106832) and the 'Term papers Highway Engineering' (T-BGU-106833) must be passed

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-BGU-106832 - Term Papers Transportation must have been passed.
2. The course T-BGU-106833 - Term Papers Highway Engineering must have been passed.

Recommendation
None

Annotation
none

T 6.41 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 6.42 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 6.43 Course: Partial Differential Equations - Exam [T-MATH-103326]

Responsible: PD Dr. Volker Grimm
Prof. Dr. Marlis Hochbruck
PD Dr. Markus Neher

Organisation: KIT Department of Mathematics

Part of: M-BGU-103695 - Supplements in Engineering
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Version
Completed coursework (written)	2	pass/fail	Each term	1

Events					
ST 2024	0181600	Advanced Mathematics 4 for the Functional Direction Civil Engineering: Partial Differential Equations	2 SWS	Lecture	Grimm
ST 2024	0181700	Exercises to Advanced Mathematics 4 for the Functional Direction Civil Engineering: Partial Differential Equations	1 SWS	Practice	Grimm

Competence Certificate
written test, 60 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.44 Course: Physical Modelling in Hydraulic Engineering [T-BGU-107467]

Responsible: Dr.-Ing. Frank Seidel
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103695 - Supplements in Engineering
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each summer term	1

Events					
ST 2024	6200609	Physical Modelling in Hydraulic Engineering	2 SWS	Lecture / 🗣	Seidel

Legend: 💻 Online, 🖧 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
2 reports on analyses of experiments, appr. 5 pages each

Prerequisites
none

Recommendation
none

Annotation
Materials:

course-accompanying script,
slide copies and further learning material on the IWU homepage

T 6.45 Course: Planning Methodology [T-BGU-107450]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103694 - Basics in Engineering II
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each term	1

Events					
WT 23/24	6200104	Planning Methodology	2 SWS	Lecture / Practice (/	Vortisch, N.N.

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written test, 30 min.

Prerequisites
none

Recommendation
none

Annotation
Literature:

lecture notes
Fürst, D.; Scholles, F. (Hrsg.) 2008: Handbuch Theorien und Methoden der Raum- und Umweltplanung; Detmold: Dorothea Rohn

T 6.46 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 6.47 Course: Programming Exercises Introduction to Computer Programming I [T-BGU-103397]

Responsible: Prof. Dr.-Ing. Markus Uhlmann
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103693 - Basics in Engineering I

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each winter term	1

Events					
WT 23/24	6200114	Bauinformatik I	1 SWS	Lecture /	Uhlmann, Scherer
WT 23/24	6200115	Übungen zu Bauinformatik I	1 SWS	Practice /	Uhlmann

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
3 attested programming exercises

Prerequisites
none

Recommendation
none

Annotation
none

T 6.48 Course: Programming Exercises Introduction to Computer Programming II [T-BGU-103399]

Responsible: Prof. Dr.-Ing. Markus Uhlmann
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103695 - Supplements in Engineering
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each summer term	1

Events					
ST 2024	6200422	Construction Informatics II	1 SWS	Lecture / 🗣	Uhlmann
ST 2024	6200423	Exercises Construction Informatics II	1 SWS	Practice / 🗣	Uhlmann

Legend: 🖥 Online, 🌸 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
3 attested programming exercises

Prerequisites
none

Recommendation
none

Annotation
none

T 6.49 Course: Project Management (not graded) [T-BGU-107449]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103693 - Basics in Engineering I

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each term	1

Events					
WT 23/24	6200106	Project Management	2 SWS	Lecture / Practice (/	Haghsheno, John, Schneider

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate
written test, 45 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.50 Course: Project 'Plan, Design, Engineering' [T-BGU-107469]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103695 - Supplements in Engineering
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each summer term	1

Events					
ST 2024	6200613	Project 'Plan, Design, Engineering'	2 SWS	Project (P / 🗣	Zimmermann, Vallee

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
team exercise with intermediate and final presentation, presentation (including 4 plan documents) each 10 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.51 Course: Self Assignment HoC-ZAK-SpZ 1 not graded [T-BGU-111460]

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103854 - 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 stdues
This course can be used for self service assignment of grade aquired 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 6.52 Course: Self Assignment HoC-ZAK-SpZ 2 not graded [T-BGU-111461]

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103854 - 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 stdues
This course can be used for self service assignment of grade aquired 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 6.53 Course: Self Assignment HoC-ZAK-SpZ 3 not graded [T-BGU-111462]

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103854 - 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 stdues
This course can be used for self service assignment of grade aquired 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 6.54 Course: Self Assignment HoC-ZAK-SpZ 4 graded [T-BGU-111463]

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103854 - 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 stdues
This course can be used for self service assignment of grade aquired 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 6.55 Course: Self Assignment HoC-ZAK-SpZ 5 graded [T-BGU-111464]

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103854 - 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 stdues
This course can be used for self service assignment of grade aquired 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 6.56 Course: Self Assignment HoC-ZAK-SpZ 6 graded [T-BGU-111465]

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103854 - 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 stdues
This course can be used for self service assignment of grade aquired 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 6.57 Course: Self Assignment HoC-ZAK-SpZ 7 not graded [T-BGU-112819]

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103854 - 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 stdues
This course can be used for self service assignment of grade aquired 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 6.58 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 stdues
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
Knowledge from 'Basic Module ' and 'Elective Module ' is helpful.

T 6.59 Course: Statics of Rigid Bodies [T-BGU-103377]

Responsible: Prof. Dr.-Ing. Peter Betsch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101745 - Statics of Rigid Bodies

Type	Credits	Grading scale	Recurrence	Version
Written examination	7	Grade to a third	Each term	1

Events					
WT 23/24	6200101	Statik starrer Körper	4 SWS	Lecture /	Franke
WT 23/24	6200102	Übungen zu Statik starrer Körper	2 SWS	Practice /	Zähringer, Kinon
WT 23/24	6200103	Tutorien zu Statik starrer Körper		Tutorial (/	Mitarbeiter/innen

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written exam, 100 min.

part of the Orientation Examination according to § 8 Par. 1, to be taken until the end of the examination period of the 2nd semester

Prerequisites
none

Recommendation
none

Annotation
none

T 6.60 Course: Strength of Materials [T-BGU-103378]

Responsible: Prof. Dr.-Ing. Thomas Seelig
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101746 - Strength of Materials

Type	Credits	Grading scale	Recurrence	Version
Written examination	9	Grade to a third	Each term	1

Events					
ST 2024	6200201	Strength of Materials	4 SWS	Lecture /	Franke
ST 2024	6200202	Exercises to Strength of Materials	2 SWS	Practice /	Kinon, Zähringer
ST 2024	6200203	Tutorials Technical Mechanics		Tutorial (/	Mitarbeiter/innen

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written exam, 100 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.61 Course: Structural Analysis I [T-BGU-103387]

Responsible: Prof. Dr.-Ing. Steffen Freitag
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101752 - Structural Analysis

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each term	1

Events					
ST 2024	6200401	Structural Analysis I	2 SWS	Lecture / 🗣	Freitag
ST 2024	6200402	Exercises to Structural Analysis I	2 SWS	Practice / 🗣	Geiger
ST 2024	6200403	Tutorials Structural Analysis I	2 SWS	Tutorial (/ 🗣	Geiger

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written exam, 120 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.62 Course: Structural Analysis II [T-BGU-103388]

Responsible: Prof. Dr.-Ing. Steffen Freitag
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101752 - Structural Analysis

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each term	1

Events					
WT 23/24	6200501	Structural Analysis II	2 SWS	Lecture / 🗣	Freitag
WT 23/24	6200502	Exercises to Structural Analysis II	2 SWS	Practice / 🗣	Panther
WT 23/24	6200503	Tutorien zu Baustatik II	2 SWS	Tutorial (	Panther

Legend: 💻 Online, 🗣 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
written exam, 120 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.63 Course: Surveying for Civil Engineers and Geophysicists (ungraded) [T-BGU-101683]

Responsible: Jan Rabold
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103694 - Basics in Engineering II
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	2	pass/fail	Each summer term	3

Events					
ST 2024	6071202	Vermessungskunde (bauiBFW5-VERMK)	1 SWS	Lecture / 🗣	Rabold
ST 2024	6071203	Übungen zu Vermessungskunde (bauiBFW5-VERMK)	2 SWS	Block / 🗣	Rabold

Legend: 🖥 Online, 🌐 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
Qualified participation in all compulsory exercises, acceptance of the group calculation exercise sheet.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.64 Course: Technology and Management in Construction [T-BGU-103392]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101754 - Technology and Management in Construction

Type	Credits	Grading scale	Recurrence	Version
Written examination	11	Grade to a third	Each term	1

Events					
ST 2024	6200410	Construction Technology	3 SWS	Lecture /	Gentes, Haghsheno, Schneider
ST 2024	6200411	Exercises to Construction Technology	1 SWS	Practice /	Gentes, Haghsheno, Schneider, Waleczko
ST 2024	6200412	Construction Management	2 SWS	Lecture /	Lennerts, Schmidt-Bäumler
ST 2024	6200413	Exercises Construction Management	1 SWS	Practice /	Lennerts, Schmidt-Bäumler
ST 2024	6200414	Facility and Real Estate Management	1 SWS	Lecture /	Lennerts, Schmidt-Bäumler

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written exam, 150 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.65 Course: Term Papers Highway Engineering [T-BGU-106833]

Responsible: Dr.-Ing. Matthias Zimmermann
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103486 - Mobility and Infrastructure

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each summer term	1

Events					
ST 2024	6200408	Design Basics in Highway Engineering	2 SWS	Lecture / 🗣	Plachkova-Dzhurova, Zimmermann
ST 2024	6200409	Exercises to Design Basics in Highway Engineering		Practice / 🗣	Plachkova-Dzhurova, Zimmermann

Legend: 💻 Online, 🖧 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
4 term papers, each paper 5-8 pages incl. planning documents

Prerequisites
none

Recommendation
none

Annotation
none

T 6.66 Course: Term Papers Transportation [T-BGU-106832]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103486 - Mobility and Infrastructure

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each summer term	1

Events					
ST 2024	6200406	Transportation Systems	2 SWS	Lecture / 🗣	Vortisch
ST 2024	6200407	Exercises to Transportation Systems		Practice / 🗣	Vortisch, Mitarbeiter/innen

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
3 term papers, each paper 5-8 pages

Prerequisites
none

Recommendation
none

Annotation
none

T 6.67 Course: Theory of Building Materials [T-BGU-103382]

Responsible: Prof. Dr.-Ing. Frank Dehn
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101750 - Building Materials

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each term	1

Events					
ST 2024	6200206	Theory of Building Materials	1 SWS	Lecture / 🗣	Dehn
ST 2024	6200207	Exercises to Theory of Building Materials	1 SWS	Practice / 🗣	Mitarbeiter/innen

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
written exam, 60 min.

part of the Orientation Examination according to § 8 Par. 1, to be taken until the end of the examination period of the 2nd semester

Prerequisites
none

Recommendation
none

Annotation
none

T 6.68 Course: Trades and Technology in Turnkey Construction [T-BGU-110821]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-103695 - Supplements in Engineering
M-BGU-103857 - Further Examinations

Type	Credits	Grading scale	Recurrence	Expansion	Version
Completed coursework	2	pass/fail	Each term	1 terms	1

Events					
WT 23/24	6200521	Gewerke und Technik im schlüsselfertigen Hochbau	2 SWS	Lecture /	Denzer, Schneider

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Competence Certificate
written test, 45 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 6.69 Course: Water and Environment [T-BGU-106800]

Responsible: PD Dr.-Ing. Stephan Fuchs
Prof. Dr. Mario Jorge Rodrigues Pereira da Franca
Dr.-Ing. Frank Seidel
Prof. Dr.-Ing. Erwin Zehe

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

Part of: M-BGU-103405 - Water and Environment

Type	Credits	Grading scale	Recurrence	Version
Written examination	12	Grade to a third	Each term	1

Events					
WT 23/24	6200511	Wasserbau und Wasserwirtschaft	2 SWS	Lecture	Rodrigues Pereira da Franca
WT 23/24	6200512	Übungen zu Wasserbau und Wasserwirtschaft	1 SWS	Practice	Seidel
WT 23/24	6200513	Hydrology	2 SWS	Lecture / 🗣	Zehe, Wienhöfer
WT 23/24	6200514	Tutorial Hydrology	1 SWS	Practice / 🗣	Zehe, Wienhöfer
ST 2024	6200603	Water Supply and Sanitation	3 SWS	Lecture / Practice (/ 🗣	Fuchs

Legend: 💻 Online, 🖧 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
written exam, 180 min.

Prerequisites
The module examinations in den subjects Mechanics and Mathematics as well as the module examination Building Construction has to be passed all except two.

Modeled Conditions
You have to fulfill 7 of 9 conditions:

1. The module M-BGU-101745 - Statics of Rigid Bodies must have been passed.
2. The module M-BGU-101746 - Strength of Materials must have been passed.
3. The module M-BGU-101747 - Dynamics must have been passed.
4. The module M-BGU-101748 - Hydromechanics must have been passed.
5. The module M-MATH-101716 - Analysis and Linear Algebra must have been passed.
6. The module M-MATH-101714 - Integration and Multivariate Analysis must have been passed.
7. The module M-BGU-101749 - Applied Statistics must have been passed.
8. The module M-MATH-101712 - Differential Equations must have been passed.
9. The module M-BGU-101751 - Building Constructions must have been passed.

Recommendation
none

Annotation
none

Appendix: Exemplary Curriculum

The curriculum by example is not at all any recommendation with respect to the selected learning controls in the modules 'Basics in Engineering II' and 'Supplements in Engineering' !

Subject	Module	Course	Type	1. sem			2. sem			3. sem			4. sem			5. sem			6. sem		
				HpW	LC	CP	HpW	LC	CP	HpW	LC	CP	HpW	LC	CP	HpW	LC	CP	HpW	LC	CP
Mechanics	Statics of Rigid Bodies	Statics of Rigid Bodies	L/E	3/2	**wE OE**	7															
	Strength of Materials	Strength of Materials	L/E				4/2	**wE**	9												
	Dynamics	Dynamics	L/E							2/2	nA[1] **wE**	6									
	Hydromechanics	Hydromechanics	L/E							2/2	nA[1] **wE**	6									
Mathematics	Analysis and Lineare Algebra	Analysis and Lineare Algebra	L/E	4/2	**wE**	9															
	Integration and Multivariate Analysis	Integration and Multivariate Analysis	L/E				4/2	**wE**	9												
	Applied Statistics	Applied Statistics	L/E				2	**wE**	3												
	Differential Equations	Differential Equations	L/E							2/1	**wE**	4									
Building Materials and Building Constructions	Building Materials	Theory of Building Materials	L/E				1/1	**wE OE**	3												
		Building Materials	L/E							4/2	**wE**	9									
	Building Constructions	Building Physics	L/E				1/1	**wE OE**	3												
		Building Construction	L/E							2/2	**wE**	6									
Basics in Engineering	Basics in Engineering I	Project Management	L/E	2	nA	2															
		Geology in Civil Engineering	L/E				2	nA	2												
		Introduction to Computer Programming I	L/E	1/1	nA[1] nA	2															
	Basics in Engineering II	Building Chemistry	L	2	nA	2															
		Laboratory Course	P	2	nA	2															
Interdisciplinary Qualifications	Interdisciplinary Qualifications	selection from the offer of HoC and ZAK		2	nA	3	2	nA	3												
Structural Analysis	Structural Analysis	Structural Analysis I	L/E										2/2	**wE**	5						
		Structural Analysis II	L/E													2/2	**wE**	5			
Structural Engineering	Basics of Reinforced Concrete	Basics of Reinforced Concrete I	L/E													2/1	**wE**	4			
		Basics of Reinforced Concrete II	L/E																2	**wE**	2
	Basics in Steel and Timber Structures	Basics in Steel Structures	L/E													2/1	**wE**	4			
		Basics in Timber Structures	L/E													2/1	**wE**	4			
Water and Environment	Water and Environment	Hydraulic Engineering and Water	L/E													2/1		4		**wE**	8
		Hydrology	L/E													2/1					
		Sanitary Environmental Engineering	L/E																2/1		
Mobility and Infrastructure	Mobility and Infrastructure	Spatial Planing and Planing Law	L/E										2/1	nA[1]	12						
		Transportation	L/E										2/1	nA[1]							
		Design Basics in Highway Engineering	L/E										2/1	**wE**							
Technology and Management in Construction	Technology and Management in Construction	Construction Technology	L/E										3/1	**wE**	11						
		Economics in Construction Operation	L/E										2/1								
		Facility and Real Estate Management I	L										1								
Geotechnical Engineering	Geotechnical Engineering	Basics in Soil Mechanics	L/E										2/2	**wE**	5.5						
		Basics in Foundation Engineering	L/E													2/2	**wE**	5.5			
Supplements in Engineering	Supplements in Engineering	Physical Modelling in Hydraulic Engineering	L																2	nA	2
		Project 'Plan. Design. Engineering'	Pj																2	nA	2
		Life Cycle Management	L/E																2	nA	2
		Computer Aided Design (CAD)	L/E													2	nA	2			
Bachelor Thesis	Bachelor Thesis																				12
Summe				**21**	**2E+ 6nA**	**27**	**22**	**5E+ 2nA**	**32**	**21**	**5E+ 2nA**	**31**	**25**	**4E+ 2nA**	**33.5**	**25**	**5E+ 1nA**	**28.5**	**11**	**2E+ 3nA**	**28**