

## Module Handbook

# Mobility and Infrastructure (Master of Science (M.Sc.), ER/SPO 2019)

Summer term 2025

Date: 06/03/2025

KIT DEPARTMENT OF CIVIL ENGINEERING, GEO- AND ENVIRONMENTAL SCIENCES



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

### 1 Preliminary remarks

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

In addition to the module handbook, information on the individual courses (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 is indicated in the module tables (Chapt. 2) and partly in the course catalog (online). Information on the examinations in the current semester is provided via the portal Campus Management for Students and via notices and on the institutes' web pages as well.

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## 2 Curriculum

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

[https://www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2019\\_AB\\_037.pdf](https://www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2019_AB_037.pdf)

(2019 KIT 037 Studien- und Prüfungsordnung des Karlsruher Instituts für Technologie (KIT) für den Masterstudiengang Mobilität und Infrastruktur; *in German*)

[https://www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2020\\_AB\\_049.pdf](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 63; *in German*)

[https://www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2022\\_AB\\_016.pdf](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 59; *in German*)

[https://www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2022\\_AB\\_037.pdf](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 58; *in German*)

[https://www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2023\\_AB\\_029.pdf](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 63; *in German*)

### 2.1 Objectives of the master degree program

The graduates of the master degree program 'Mobility and Infrastructure' at Karlsruhe Institute of Technology (KIT) extended their scientific qualifications obtained in the bachelor degree program with orientation to the professional profile often named as 'traffic engineer', and developed them beyond the understanding of technical and scientific interrelations in one of the fields of expertise transport planning, traffic engineering, road or railroad construction.

Due to the complementary fields civil engineering, economic engineering, informatics, architecture (urban planning) and mechanical engineering (automotive engineering), graduates of all mentioned profiles have knowledge ranging from the societal background of mobility as considered in the empirical mobility research, the economic interrelations between users and operators of traffic infrastructure up to the technical realizations of vehicles and roadways roads or tracks and systems of communication and information technology enabling and optimizing the operation of such. They are able to plan, construct and operate mainly road or track aligned transport systems with their broad interdisciplinary understanding of the wide range and complexity of the task of ensuring mobility in a modern society.

The graduates are able to develop alternatives from the understanding of existing facts and regulations considering present developments and scientific discussions, to question existing methods and work on developing them. Furthermore, at work they have the capability to be able to communicate and collaborate efficiently with colleagues from several disciplines and to lead expert groups from different disciplines.

## 2.2 Structure of the master degree program

The master degree program 'Mobility and Infrastructure' comprises 120 credit points (CP). It is subdivided into a compulsory elective block, the **Profile Studies** (60 CP), a compulsory block, the **Supplementary Studies** (30 CP), and the **Master's Thesis** (30 CP). In the Profile Studies one of the **Study Profiles** must be selected:

- I. Urban and Transport Planning
- II. Traffic Engineering
- III. Highway Engineering

The focus of these study profiles on a specific field is defined by the corresponding modules (s. Tab. 1 - 3) assigned according to the different characteristics of the professional profile. Each profile consists of two compulsory elective subjects. In the one compulsory elective subject (30 CP) five specific **basic modules** are predefined. The other compulsory elective subject (30 CP) is characterized by the corresponding module catalog with the **specialization modules**. All modules in the master degree program are integrated into these study profiles and normally comprise 6 CP. Modules imported from other study programs comprise 6 or 8 CP. Most of the modules are assigned to several profiles.

The Supplementary Studies comprise the two compulsory subjects **Subject-Specific Supplements** (24 CP) and **Interdisciplinary Qualifications** (6 CP). Within the subject Subject-Specific Supplements, all modules not yet selected or predefined (depending on selected profile) can be freely selected as **Supplementary Modules**. The interdisciplinary qualifications can be obtained in courses from the corresponding course catalog on key competences offered by the House of Competence (HoC) or of the 'General Studies. Forum Science and Society' (FORUM, formerly ZAK) or language courses of the 'Sprachenzentrum' (SpZ, center of language studies) and can be freely selected.

1. Sem.	2. Sem.	3. Sem.	4. Sem.
<b>Profile Studies (compulsory elective)</b>			<b>Master's Thesis</b>  30 CP  duration of preparation: 6 months  completion by presentation
selected Study Profile: 30 CP  Urban and Transport Planning - Basics (P 1) Traffic Engineering - Basics (P 2) Highway Engineering - Basics (P 3)  5 modules with 6 CP predefined			
selected Study Profile: 30 CP  Urban and Transport Planning - Specialization (P 1) Traffic Engineering - Specialization (P 2) Highway Engineering - Specialization (P 3)  5 modules selectable			
<b>Supplementary Studies (compulsory)</b>			
Subject-Specific Supplements: 24 CP  subject-specific modules freely selectable			
Interdisciplinary Qualifications 6 CP (selectable out of the offer of HoC, FORUM and SpZ)			
<b>Additional Studies</b>			
Additional Accomplishments: freely selectable out of the entire course offer of KIT			max. 30 CP

## 2.2.1 Profile 'Urban and Transport Planning' (P1)

The graduates of the qualification profile 'Urban and Transport Planning' can apply their knowledge on the background of the origin of mobility as well as about the methods predicting traffic demand on long term and large scales for planning traffic infrastructure and transportation systems in the context of regional planning, particularly urban planning. Furthermore, they are able to analyze the properties of the different transportation systems considering technical as well as economical interrelations in transportation and based on this to opt for the appropriate mode of transport.

**Table 1: Modules in Profile Urban and Transport Planning**

Module			Course				LC			
Code	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP		
(mobi)					W	S				
Modules Urban and Transport Planning - Basics (predefined)										
M101:	Urban and Regional Planning	6	Urban Planning (G)	L/E	2		oE	6		
			Regional Planning (G)	L	2					
M102:	Urban Renewal	6	Urban Management (G)	L/E		2	ngA <sup>9)</sup> oE	1 2		
			History of Urban Planning (G)	L		2			wE	3
M201:	Models and Methods in Traffic Engineering and Transportation Planning	6	Methods and Models in Transportation Planning (G)	L/E	2		oE	6		
			Traffic Engineering (G)	L/E	2					
M203:	Planning of Transportation Systems	6	Characteristics of Transportation Systems (G)	L		2	wE	6		
			Strategic Transport Planning (G)	L		2				
M501:	Laws and Proceedings concerning Traffic and Roads	6	Laws concerning Traffic and Roads (G)	L		2	wE	6		
			Environmental Impact Assessment (G)	L		1				
			Assessment and Evaluation Techniques (G)	L		1				
sum basic modules		30			10	10				
Modules Urban and Transport Planning - Specialization (selectable)										
M502:	Project Integrated Planning <sup>2)</sup>	6	Project Integrated Planning (G)	Pj	4		ngA <sup>9)</sup> oE	5 1		
M103:	Space and Infrastructure <sup>1)</sup>	6	Introduction to GIS for Students of Natural, Engineering and Geo Sciences (G)	L/E	4		ngA <sup>9)</sup> ngA <sup>9)</sup> wE	3 1 2		
			Logistics, Supply and Disposal (G)	L/E		2				
M205:	Intermodality in Freight, Long-distance and Air Transport	6	Freight Transport (G)	L/E		2	wE	3		
			Long-distance and Air Traffic (G)	L	2		wE	3		
M206:	Analysis and Evolution of Mobility	6	Transportation Data Analysis (G)	L/E	2		ngA <sup>9)</sup> oE	0 6		
			Mobility Services and new Forms of Mobility (G)	L		2				
M208:	Special Issues of Public Transport <sup>3,6)</sup>	6	Tendering, Planning and Financing in Public Transport (G)	L		2	oE	3		
			Information Management for Public Mobility Services (G)	L/E	2				EoT	3
			Sustainability in Mobility Systems (G)	L	2				wE	3
			Seminar in Transportation <sup>4)</sup> (G)	S	2	2			EoT	3
			Seminar on Modeling and Simulation in Transportation (G)	S	2				EoT	3
M209:	Seminars on Empirical Research, Modeling and Simulation in Transportation <sup>7)</sup>	6	Seminar in Transportation <sup>4)</sup> (G)	S	2	2	EoT	3		
			Seminar on Modeling and Simulation in Transportation (G)	S	2				EoT	3

(continuing next page)



**Table 1: Modules in Profile Urban and Transport Planning (continued)**

Module			Course				LC	
Code	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP
(mobi)					W	S		
M210:	Interdiscipliny Design – Urban and Transportation Planning	6	'Interdiscipliny Design – Urban and Transportation Planning' *) <sup>5)</sup> (G/E)	S/Pj	(4)	(4)	EoT	6
M304:	City Transport Facilities	6	City Transport Facilities (G)	L/E	4		ngA <sup>9)</sup> oE	2 4
M601:	Urban Design in Practice <sup>8a)</sup>	6	Fundamentals of Town Planning (G)	L		4	oE	4
			Urban Development: Urban Perspectives Basic Concepts of Urban Design and Planning (G)	L	2		oE	2
M603:	Network Economics	6	Transport Economics (G)	L/E		2/1	wE	3
			Competition in Networks (G)	L/E	2/1		wE	3
M608:	Specialization Urban Design <sup>3,8b)</sup>	8	Methods, Strategies and Mechanisms of Urban Design: City in Focus. Interdisciplinary Planning and Designing (G)	S	2		EoT	4
			'City Theory' *) (G)	L		2	EoT	4
			Urban Typologies (G)	S		2	EoT	4
			Quarter Analysis (G)	S	4		EoT	4
			'International Urban Design' *) (E)	S	2		EoT	4
			'Special Topics of Urban Design' *) <sup>4)</sup> (E)	S	2	2	EoT	4
sum specialization modules		60			35	21		

\*) Topic of the course varies over the semester and will be available in the course catalog.

#### explanations to Table 1:

general:

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

- 1) Starting the module in winter term (W) is recommended.
- 2) Taking this module in the first semester is not recommended.
- 3) Two of the courses with the related learning controls have to be selected.
- 4) Course is offered every semester.
- 5) Course is offered irregularly (see module description).
- 6) Not more than one of the two seminars can be selected. Selecting of the seminars the module M209 cannot be selected anymore.
- 7) Selecting this module none of the seminars in the module M208 can be selected.
- 8a) Module must not be selected together with module M608.
- 8b) Module must not be selected together with module M601.

type of course:

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

type of learning control:

wE written examination  
 oE oral examination  
 EoT examination of other type  
 ngA <sup>9)</sup> not graded accomplishment as examination prerequisite

## 2.2.2 Profile 'Traffic Engineering' (P2)

The graduates of the qualification profile 'Traffic Engineering' can develop transportation systems as a whole with their deepened knowledge about technical aspects of roads and railroads, profound knowledge from computer science (simulation models, algorithms) and mechanical engineering (automotive engineering cars and railways). Thus, they are able to design innovative and optimized mobility systems in transportation with their understanding of the interrelations of those technical systems.

**Table 2: Modules in Profile Traffic Engineering**

Module			Course					LC	
Code	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP	
(mobi)					W	S			
Modules Traffic Engineering - Basics (predefined)									
M201:	Models and Methods in Traffic Engineering and Transportation Planning	6	Methods and Models in Transportation Planning (G)	L/E	2		oE	6	
			Traffic Engineering (G)	L/E	2				
M202:	Traffic Management and Simulation Methods	6	Traffic Management and Transport Telematics (G)	L/E		2	ngA <sup>6)</sup> oE	0 6	
			Traffic Flow Simulation (G)	L/E		2			
M301:	Infrastructure Management	6	Design and Construction of Highways (G)	L		2	wE	6	
			Operation and Maintenance of Highways (G)	L		2			
M304:	City Transport Facilities	6	City Transport Facilities (G)	L/E	4		ngA <sup>6)</sup> oE	2 4	
M501:	Laws and Proceedings concerning Traffic and Roads	6	Laws concerning Traffic and Roads (G)	L		2	wE	6	
			Environmental Impact Assessment (G)	L		1			
			Assessment and Evaluation Techniques (G)	L		1			
sum basic modules		30			8	12			
Modules Traffic Engineering - Specialization (selectable)									
M502:	Project Integrated Planning <sup>1)</sup>	6	Project Integrated Planning (G)	Pj	4		ngA <sup>6)</sup> oE	5 1	
M203:	Planning of Transportation Systems	6	Characteristics of Transportation Systems (G)	L		2	wE	6	
			Strategic Transport Planning (G)	L		2			
M209:	Seminars on Empirical Research, Modeling and Simulation in Transportation <sup>5)</sup>	6	Seminar in Transportation <sup>3)</sup> (G)	S	2	2	EoT	3	
			Seminar on Modeling and Simulation in Transportation (G)	S	2		EoT	3	
M210:	Interdiscipliny Design – Urban and Transportation Planning	6	'Interdiscipliny Design – Urban and Transportation Planning' *) <sup>4)</sup> (G/E)	S/Pj	(4)	(4)	EoT	6	
M302:	Highway Design	6	IT-based Road Design (G)	L/E	2		ngA <sup>6)</sup> oE	2 4	
			Highway Design Project Study (G)	L/E	2				
M305:	Road Safety	6	Safety Management in Highway Engineering (G)	L/E		2	ngA <sup>6)</sup> wE	3 3	
			Seminar in Highway Engineering (G)	S		2			
M602:	2D/3D Image Analysis and Image based Tracking Methods	6	2D Computer Vision (G)	L	1		oE	3	
			3D Computer Vision (G)	L	2				
			Image Sequence Analysis (G)	L	2				oE
M604:	Automotive Engineering	6	Automotive Engineering I (G)	L	4		wE	6	
M605:	Algorithms I	6	Algorithms I (G)	L/E		4	wE	6	
M606:	Algorithms for Routing	6	Algorithms for Routing (G)	L/E		3	oE	6	

(continuing next page)

\*) Topic of the course varies over the semester and will be available in the course catalog.

**Table 2: Modules in Profile Traffic Engineering (continued)**

Module			Course				LC	
Code	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP
(mobi)					W	S		
M607:	Technology of Rail Vehicles	6	Rail Vehicle Technology <sup>3)</sup> (G)	L	2	2	wE	6
			Rail System Technology <sup>3)</sup> (G)	L	2	2		
M609:	Mobility- and Vehicle-Systems for Rail and Road Transport <sup>2)</sup>	8	Railways in the Transportation Market (G)	B		2	oE	4
			Digitization in the Railway System (G)	L	2		oE	4
			Vehicle Systems for Urban Mobility <sup>3)</sup> (G)	L	2	2	oE	4
			Innovation and Project Management with Case Study 'Innovative Rail Vehicle' <sup>3)</sup> (G)	L	2	2	EoT	4
sum specialization modules		74			33	29		

**explanations to Table 2:**

## general:

- LC learning control  
 CP credit point  
 HpW / SWS hours per week  
 W / S winter term / summer term  
 G / E language German / English  
 1) Taking this module in the first semester is not recommended.  
 2) Two of the courses with the related learning controls have to be selected.  
 3) Course is offered every semester.  
 4) Course is offered irregularly (see module description).  
 5) Selecting this module none of the seminars in the module M208 can be selected.

## type of course:

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

## type of learning control:

- wE written examination  
 oE oral examination  
 EoT examination of other type  
 ngA <sup>6)</sup> not graded accomplishment as examination prerequisite

### 2.2.3 Profile 'Highway Engineering' (P3)

The graduates of the qualification profile 'Highway Engineering' can correctly evaluate the interrelations (e.g. between design and operation of a highway) or the consequences of decisions (e.g. the impact of a highway on nature and landscape over decades) considering the entire life cycle of the infrastructure element highway. Thus, they are able to design, construct and operate the optimized highway for specific transportation systems.

**Table 3: Modules in Profile Highway Engineering**

Module			Course				LC	
Code	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP
(mobi)					W	S		
Modules Highway Engineering - Basics (predefined)								
M301:	Infrastructure Management	6	Design and Construction of Highways (G)	L		2	wE	6
			Operation and Maintenance of Highways (G)	L		2		
M302:	Highway Design	6	IT-based Road Design (G)	L/E	2		ngA <sup>4)</sup> oE	2 4
			Highway Design Project Study (G)	L/E	2			
M303:	Road Construction	6	Practical Laboratory Training in Road Construction (G)	L/E	2		oE	6
			Pavement Structural Design and Failure Analysis (G)	L	2			
M304:	City Transport Facilities	6	City Transport Facilities (G)	L/E	4		ngA <sup>4)</sup> oE	2 4
M501:	Laws and Proceedings concerning Traffic and Roads	6	Laws concerning Traffic and Roads (G)	L		2	wE	6
			Environmental Impact Assessment (G)	L		1		
			Assessment and Evaluation Techniques (G)	L		1		
sum basic modules		30			12	8		
Modules Highway Engineering - Specialization (selectable)								
M502:	Project Integrated Planning <sup>2)</sup>	6	Project Integrated Planning (G)	Pj	4		ngA <sup>4)</sup> oE	5 1
M305:	Road Safety	6	Safety Management in Highway Engineering (G)	L/E		2	ngA <sup>4)</sup> wE	3 3
			Seminar in Highway Engineering (G)	S		2		
M306:	Special Topics in Highway Engineering	6	Technical and Economic Management Tools in Highway Engineering *) (G)	L		2	oE	6
			Simulations and Analysis Methods in Highway Engineering *) (G)	L		1		
			Special Topics in Highway Engineering *) (G)	L		1		
M101:	Urban and Regional Planning	6	Urban Planning (G)	L/E	2		oE	6
			Regional Planning (G)	L	2			
M103:	Space and Infrastructure <sup>1)</sup>	6	Introduction to GIS for Students of Natural, Engineering and Geo Sciences (G)	L/E	4		ngA <sup>4)</sup> ngA <sup>4)</sup> wE	3 1 2
			Logistics, Supply and Disposal (G)	L/E		2		
M201:	Models and Methods in Traffic Engineering and Transportation Planning	6	Methods and Models in Transportation Planning (G)	L/E	2		oE	6
			Traffic Engineering (G)	L/E	2			

(continuing next page)

\*) Course will not be offered in summer term 2025.

**Table 3: Modules in Profile Highway Engineering (continued)**

Module			Course				LC	
Code	Name	CP	Name (Language)	Type	HpW / SWS		Type	CP
(mobi)					W	S		
M202:	Traffic Management and Simulation Methods	6	Traffic Management and Transport Telematics (G)	L/E		2	ngA <sup>4)</sup> oE	0 6
			Traffic Flow Simulation (G)	L/E		2		
M210:	Interdisciplin Design – Urban and Transportation Planning	6	'Interdisciplin Design – Urban and Transportation Planning' **) <sup>3)</sup> (G/E)	S/Pj	(4)	(4)	EoT	6
<b>sum specialization modules</b>		<b>48</b>			<b>20</b>	<b>18</b>		

\*\*) Topic of the course varies over the semester and will be available in the course catalog.

#### explanations to Table 3:

general:

LC learning control

CP credit point

HpW /

SWS hours per week

W / S winter term / summer term

G / E language German / English

1) Starting the module in winter term (W) is recommended.

2) Taking this module in the first semester is not recommended.

3) Course is offered irregularly (see module description).

type of course:

L lecture

L/E lecture and exercise, separate or integrated

S seminar

Pj project

type of learning control:

wE written examination

oE oral examination

ngA<sup>4)</sup> not graded accomplishment as examination prerequisite



## 2.3 Mentoring, module selection, individual curriculum

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

Profile 1: Prof. P. Vortisch, PD M. Kagerbauer, Dr.-Ing. M. Zimmermann

Profile 2: Prof. P. Vortisch, PD M. Kagerbauer, Dr.-Ing. M. Zimmermann

Profile 3: Prof. P. Vortisch, PD M. Kagerbauer, Dr.-Ing. M. Zimmermann

The selected profile determines the five **basic modules**. The five **specialization modules** are chosen from the corresponding module catalog (s. Tab. 1 - 3). Within the Supplementary Studies four subject-specific modules have to be selected freely from the master degree program 'Mobility and Infrastructure' or any related one.

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

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

## 2.4 Interdisciplinary Qualifications

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

Registering for courses on key competences of HoC and FORUM (formerly ZAK) as well as the language courses of SpZ takes place directly at HoC, FORUM (formerly ZAK) or SpZ. The examinations results are typically uploaded as 'Not assigned grades'. The students can **assign them in two steps**. Firstly, they **select** the corresponding 'Teilleistungen' with the title 'Self Assignment HoC-FORUM-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 FORUM (formerly 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 Master Civil Engineering](#).

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

## 2.5 Begin and complete a module

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

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

## 2.6 Registration, deregistration, repetition of examinations

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

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

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

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

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

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

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

## 2.7 Students with disability or chronic disease

Students in special circumstances are students with disabilities or chronic diseases, or on maternity leave, with children or dependents in need of care. The regulations on compensation for disadvantages include preferential access to courses with limited attendance, taking examinations under individually designed conditions, or adjustments to deadlines. These are described in detail in the [Satzung über nachteilsausgleichende Regelungen in den Bachelor- und Masterstudiengängen am Karlsruher Institut für Technologie \(KIT\)](#) (*in German*; see also SPO § 12 and 13 according to [Satzung zur Änderung der Regelungen über den Nachteilsausgleich in den Studien- und Prüfungsordnungen, Artikel 59](#); *in German*).

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

## 2.8 Crediting and recognition of already obtained accomplishments

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

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

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

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

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

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

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

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

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

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

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

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

## 2.10 Semester abroad

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

## 2.11 Additional accomplishments

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

The examination in the desired additional accomplishment should be registered online by the student within the registration period. The online registration to one of these exams requires first the selection of the module and the desired 'Teilleistungen'. The additional module for the Accompanying Studies of FORUM (formerly ZAK) can be selected directly. If selecting this module it has to be considered that the extent of possible further additional accomplishments is reduced by the extent of the FORUM module even if this is not completed. Additional accomplishments available in the module [Further Examinations](#) can be also selected directly. If the designated additional accomplishment or additional module are 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.

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

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

## 3 Further information

### 3.1 About the module handbook . . .

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

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

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

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

### 3.2 About module examinations, examination committee . . .

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

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

### 3.3 About changes in module offered . . .

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

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

### 3.4 Contact persons

#### Dean of Study Affairs:

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

#### Study Program Coordination:

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

#### Examination Committee Master Civil Engineering:

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

#### Students' Advisory Service:

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

#### Study abroad:

Prof. Dr. Olivier Eiff (Erasmus Coordinator)  
Mrs. Angelika Fels (person in charge)  
Institute for Water and Environment, Bldg. 10.81, R. 128 (1<sup>st</sup> floor)  
consultation: on appointment  
Phone: 0721/608-47245  
Email: erasmus-civil@bgu.kit.edu  
Web: [https://www.bgu.kit.edu/english/outgoing\\_erasmus.php](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 (3<sup>rd</sup> floor)  
consultation: s. <http://www.fs-bau.kit.edu>  
Phone: 0721/608-43895  
Email: info@fs-bau.kit.edu  
Web: <http://www.fs-bau.kit.edu>

### 3.5 Abbreviations, translations

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



## 4 Current changes

Major changes will be listed here as from summer term 2025. Despite the fact that this process is mapped with great care, other/minor changes may occur.

### changed examinations and not graded accomplishments as from summer term 2025:

Traffic Management and Simulation Methods [mobiM202-VERMANAGE]:

The 'Exercise Transportation Data Analysis', 0 CP, is not graded examination prerequisite.

## 5 Modules

### M

### 5.1 Module: Urban and Regional Planning (mobIM101-PLSTAREG) [M-BGU-100007]

**Responsible:** Prof. Dr.-Ing. Peter Vortisch  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Basics / Urban and Transport Planning](#)  
[Profile Specialization / Highway Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-100050	<a href="#">Urban and Regional Planning</a>	6 CR	Soylu, Wilske

#### Competence Certificate

- 'Teilleistung' T-BGU-100050 with oral examination according to § 4 Par. 2 No. 2  
 details about the learning control see at the 'Teilleistung'

#### Prerequisites

none

#### Competence Goal

The aim is to provide an overview of important tasks for spatial planning, of the legal principles, methods and strategies for solving spatial problems on urban and regional level. The students shall be able to develop planning strategies, particularly in the field of planning on a supra-local level.

#### Content

In the lectures basic goals and tasks of planning of different levels, procedures and instruments, the relationship between governmental and private planning are taught. The scientific contexts are developed systematically to strengthen the various methodological approaches to understand and evaluate them. Particular attention will be paid inter alia to changing conditions, such as demographic and economic developments.

#### Module grade calculation

grade of the module is grade of the exam

#### Annotation

none

#### Workload

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

- Urban Planning lectures/exercises: 30 h
- Regional Planning lectures: 30 h

independent study:

- preparation and follow-up Urban Planning lectures/exercises: 30 h
- preparation and follow-up Regional Planning lectures: 30 h
- examination preparation: 60 h

total: 180 h

#### Recommendation

module Mobility and Infrastructure [bauIBFP5-MOBIN]

#### Literature

list of literature to module

**M****5.2 Module: Urban Renewal (mobim102-PLSTUMB) [M-BGU-100013]**

**Responsible:** Prof. Dr.-Ing. Peter Vortisch  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Basics / Urban and Transport Planning](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-108441	<a href="#">History of Urban Planning</a>	3 CR	Ross
T-BGU-113672	<a href="#">Examination Prerequisite Urban Management</a>	1 CR	Karmann-Woessner
T-BGU-108442	<a href="#">Urban Management</a>	2 CR	Karmann-Woessner

**Competence Certificate**

- 'Teilleistung' T-BGU-108441 with oral written according to § 4 Par. 2 No. 1  
 - 'Teilleistung' T-BGU-113672 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite to 'Teilleistung' T-BGU-108442  
 - 'Teilleistung' T-BGU-108442 with oral examination according to § 4 Par. 2 No. 2  
 details about the learning controls see at the respective 'Teilleistung'

**Prerequisites**

none

**Competence Goal**

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

**Content**

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

**Module grade calculation**

grade of the module average of grades of the partial exams

**Annotation****Please note:**

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

As from winter semester 2024/25 there is an examination prerequisite to the examination Urban Management.

**Workload**

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

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

independent study:

- preparation and follow-up Urban Management lectures/exercises: 10 h
- preparation of a presentation or seminar paper (examination prerequisite): 30 h
- examination preparation Urban Management (partial examination): 20 h
- preparation and follow-up Urban Planning I: History of Urban Planning and the Built Environment lectures: 30 h
- examination preparation History of Urban Planning (partial examination): 30 h

total: 180 h

**Recommendation**

none

**Literature**

list of literature to module

**M****5.3 Module: Space and Infrastructure (mobIM103-PLRAUMINF) [M-BGU-100014]**

**Responsible:** PD Dr.-Ing. Martin Kagerbauer  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Specialization / Urban and Transport Planning](#)  
[Profile Specialization / Highway Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-103541	<a href="#">Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite</a>	3 CR	Wursthorn
T-BGU-113017	<a href="#">Exercise Logistics, Supply and Disposal</a>	1 CR	Kagerbauer
T-BGU-100056	<a href="#">Space and Infrastructure</a>	2 CR	Kagerbauer, Wursthorn

**Competence Certificate**

- 'Teilleistung' T-BGU-103541 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite
- 'Teilleistung' T-BGU-113017 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite
- 'Teilleistung' T-BGU-100056 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 the knowledge of the type and creation, management and presentation of spatial data. They acquire the ability to deal with Geographic Information Systems and to develop and interpret spatial analyses with GIS also using visual programming.

Students will be able to explain the relationships between spatial development and infrastructure planning. They are able to present and analyze spatial data in a meaningful way. They are able to explain the importance of the coupling between the planning task and the use of IT-supported tools in spatial planning and thus to link the theoretical requirement and the planning reality on the one hand and the instruments on the other hand.

**Content**

- introduction to geographic information systems as well as basics of EDP and cartography
- explanation of different data models (technical and geometric data)
- handling of geodata, spatial analysis of geodata as well as the presentation of results
- introduction to infrastructure and development planning
- basics of supply and disposal planning
- application of computer-aided planning methods

**Module grade calculation**

grade of the module is grade of the exam

**Annotation**

none



**Workload**

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

- Introduction to GIS for Students of Natural, Engineering and Geo Sciences lectures/exercises: 60 h
- Logistics, Supply and Disposal lecture/exercises: 30 h

independent study:

- preparation and follow-up Introduction to GIS for Students of Natural, Engineering and Geo Sciences lectures, exercises: 10 h
- preparation of the Exercises Introduction to GIS for Students of Natural, Engineering and Geo Sciences (not graded examination prerequisite): 20 h
- preparation and follow-up Logistics, Supply and Disposal lectures: 10 h
- preparation of the Exercises Logistics, Supply and Disposal (not graded examination prerequisite): 20 h
- examination preparation: 30 h

total: 180 h

**Recommendation**

beginning the module in winter term

**Literature**

list of literature for module

**M****5.4 Module: Models and Methods in Traffic Engineering and Transportation  
Planning (mobiM201-VERMODELL) [M-BGU-100008]**

**Responsible:** Prof. Dr.-Ing. Peter Vortisch  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Basics / Urban and Transport Planning](#)  
[Profile Basics / Traffic Engineering](#)  
[Profile Specialization / Highway Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-100012	<a href="#">Models and Methods in Traffic Engineering and Transportation Planning</a>	6 CR	Vortisch

**Competence Certificate**

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

**Prerequisites**

none

**Competence Goal**

see German version

**Content**

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

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

Traffic Engineering:

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

**Module grade calculation**

grade of the module is grade of the exam

**Annotation**

none

**Workload**

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

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

independent study:

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

total: 180 h

**Recommendation**

none

**Literature**

lecture notes with additional references / exercises

**M****5.5 Module: Traffic Management and Simulation Methods (mobiM202-VERMANAGE) [M-BGU-100015]**

**Responsible:** Prof. Dr.-Ing. Peter Vortisch  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Basics / Traffic Engineering](#)  
[Profile Specialization / Highway Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-113971	<a href="#">Exercise Transportation Data Analysis</a>	0 CR	Vortisch
T-BGU-100008	<a href="#">Traffic Management und Simulation Methods</a>	6 CR	Vortisch

**Competence Certificate**

- 'Teilleistung' T-BGU-113971 with with not graded accomplishment according to § 4 Par. 3 as examination prerequisite
- 'Teilleistung' T-BGU-100008 with oral examination according to § 4 Par. 2 No. 2

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

**Prerequisites**

none

**Competence Goal**

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

**Content**

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

**Module grade calculation**

grade of the module is grade of the exam

**Annotation**

As from summer term 2025 the Exercise Transportation Data Analysis will be implemented as examination prerequisite.

**Workload**

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

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

independent study:

- preparation and follow-up Traffic Management and Transport Telematics lectures/exercises: 30 h
- preparation and follow-up Traffic Flow Simulation lectures/exercises: 30 h
- preparation of the Exercises Transportation Data Analysis (not graded examination prerequisite): 10 h
- examination preparation: 50 h

total: 180 h

**Recommendation**

none

**Literature**

lecture notes

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

software documentations

**M****5.6 Module: Planning of Transportation Systems (mobIM203-VERPLAN) [M-BGU-100016]**

**Responsible:** Prof. Dr.-Ing. Peter Vortisch  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Basics / Urban and Transport Planning](#)  
[Profile Specialization / Traffic Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-100013	<a href="#">Planning of Transportation Systems</a>	6 CR	Vortisch

**Competence Certificate**

- 'Teilleistung' T-BGU-100013 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 know all common means of transport and their properties. They can assess advantages and disadvantages of the means of transport from the perspective of users, operators and the environment, and they can make decisions about the system adapted to the situation. They understand the systemic interrelation of means of transport, infrastructure and mobility behaviour. The students know the methods of transportation planning common in practice and can these critically evaluate and develop further.

**Content**

- means of transport and their properties: capacity, velocity and energy consumption;
- environmental impacts: pollutant emission, noise and traffic safety;
- origin and evolution of traffic demand;
- examples of transport systems: bicycle traffic as system, planning procedures in public transport,
- boundary conditions of strategic planning: target systems, civic participation, policy influence;
- application of models;
- activity development;
- impact investigation and evaluation;
- examples: federal road plan, international master plans;
- transport development plans

**Module grade calculation**

grade of the module is grade of the exam

**Annotation**

none

**Workload**

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

- Characteristics of Transportation Systems lectures: 30 h
- Strategic Transport Planning lectures: 30 h

independent study:

- preparation and follow-up Characteristics of Transportation Systems lectures: 30 h
- preparation and follow-up Strategic Transport Planning lectures: 30 h
- examination preparation: 60 h

total: 180 h

**Recommendation**

course Transportation (6200406)

**Literature**

lecture notes and materials are available for downloading



**M****5.7 Module: Intermodality in Freight, Long-Distance and Air Transport (mobiM205-VERINTER) [M-BGU-100020]**

**Responsible:** Prof. Dr.-Ing. Peter Vortisch  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Specialization / Urban and Transport Planning](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-106611	<a href="#">Freight Transport</a>	3 CR	Szimba, Vortisch
T-BGU-106301	<a href="#">Long-Distance and Air Traffic</a>	3 CR	Vortisch

**Competence Certificate**

- 'Teilleistung' T-BGU-106611 with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-BGU-106301 with written examination according to § 4 Par. 2 No. 1

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

**Prerequisites**

none

**Competence Goal**

Knowledges about the characteristics of freight transportation, long distance travel and air travel against the background of the globalization and and EU-integration Knowledge about the challenges and the design and of intermodal transport services.

**Content**

- relevant factors for the demand in freight transport
- methods for demand forecasts and planning in freight transport
- measures for influencing the demand in freight transport as well as their efficiency
- particularities of the airline industry in a global market shown in case studies
- organisation of the airline industry
- particularities of Long Distance Travel
- methodology of the Federal Transport Master Plan
- evolution of Long Distance Transport Systems

**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):

- Freight Transport lectures/exercises: 30 h
- Long-distance and Air Traffic lectures: 30 h

independent study:

- preparation and follow-up Freight Transport lectures/exercises: 30 h
- examination preparation Freight Transport (partial exam): 30 h
- preparation and follow-up Long-distance and Air Traffic lectures: 30 h
- examination preparation Long-distance and Air Traffic (partial exam): 30 h

total: 180 h

**Recommendation**

none

**Literature**

lecture accompanying documents

**M****5.8 Module: Analysis and Evolution of Mobility (mobiM206-VERANAMOB) [M-BGU-100583]**

**Responsible:** PD Dr.-Ing. Martin Kagerbauer  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Specialization / Urban and Transport Planning](#)  
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each term	2 terms	German	4	3

Mandatory			
T-BGU-113671	<a href="#">Exercise Transportation Data Analysis</a>	0 CR	Kagerbauer
T-BGU-101004	<a href="#">Analysis and Evolution of Mobility</a>	6 CR	Kagerbauer

**Competence Certificate**

- 'Teilleistung' T-BGU-113671 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite
- 'Teilleistung' T-BGU-101004 with oral examination according to § 4 Par. 2 No. 2

details about the learning control see at the 'Teilleistung'

**Prerequisites**

none

**Competence Goal**

The students know the methods to capture and to analyse the travel behavior of the people and recognize trends in the behaviour. They know up to date travel options and supply offers and are able to evaluate these from the point of view of users and operators.

**Content**

- capturing mobility: measurements and surveys, data preparation
- analysis: statistical methods and software tools therefore (SAS, R), also practical exercises at PC
- new forms of travel behavior, e.g. shared mobility
- mobility services: ridesharing and ridepooling services, intermodal information systems etc.
- analysis of functionality, interrelations and backgrounds of these mobility forms

**Module grade calculation**

grade of the module is grade of the exam

**Annotation**

none

**Workload**

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

- Transportation Data Analysis lectures/exercises: 30 h
- Mobility Services and new Forms of Mobility lectures/exercises: 30 h

independent study:

- preparation and follow-up Transportation Data Analysis lectures/exercises: 20 h
- preparation of the Exercise Transportation Data Analysis (examination prerequisite): 10 h
- preparation and follow-up Mobility Services and new Forms of Mobility lectures/exercises: 30 h
- examination preparation: 60 h

total: 180 h

**Recommendation**

course Transportation (6200406)

**M****5.9 Module: Special Issues of Public Transport (mobiM208-VERSPEZOEV) [M-BGU-103357]**

**Responsible:** Prof. Dr.-Ing. Peter Vortisch  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Specialization / Urban and Transport Planning](#)  
[Subject-Specific Supplements](#)

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

**Election notes**

Two of the courses with the associated examinations are to be selected.

Not more than one of the two seminars can be selected.

<b>Speical Topics (Election: between 1 and 2 items as well as between 3 and 6 credits)</b>			
T-BGU-101005	<a href="#">Tendering, Planning and Financing in Public Transport</a>	3 CR	Vortisch
T-BGU-106608	<a href="#">Information Management for Public Mobility Services</a>	3 CR	Vortisch
T-BGU-111057	<a href="#">Sustainability in Mobility Systems</a>	3 CR	Kagerbauer
<b>Seminars (Election: between 0 and 1 items as well as between 0 and 3 credits)</b>			
T-BGU-100014	<a href="#">Seminar in Transportation</a>	3 CR	Kagerbauer, Vortisch
T-BGU-112552	<a href="#">Seminar on Modeling and Simulation in Transportation</a>	3 CR	Kagerbauer, Vortisch

**Competence Certificate**

two learning controls have to be selected:

- 'Teilleistung' T-BGU-101005 with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-BGU-106608 with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-BGU-111057 with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-BGU-100014 with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-BGU-112552 with examination of other type according to § 4 Par. 2 No. 3

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

**Prerequisites**

One of the two seminars Transportation or Modeling and Simulation in Transportation can only be selected, if the module is not selected together with the module Seminars on Empirical Research, Modeling and Simulation in Transportation [mobiM209-VERKSEM].

**Competence Goal**

Students are able to familiarize themselves with special aspects of transportation particularly of public transport. They can acquire the necessary specialist knowledge, comprehend the methods commonly used in practice and critically question them. They are able to present complex issues in transportation and in particular in public transport transparently in writing or in a presentation.

**Content**

The legal framework for the organization of public transport in Germany is dealt with in detail. In this context, the financing and the planning procedure in public transport are dealt with in depth.

In addition, an introduction is given to the organizational and technical tasks involved in the planning, organization, operation and quality assurance of public mobility services, which can be solved with the help of approaches from computer science and with information systems.

Sustainability in mobility systems includes the effects of publicly available but alternative forms of mobility on the overall transport system.

In the Seminar in Transportation, current topics in traffic engineering, transport planning and travel behavior research are dealt with on a semester-by-semester basis. Information on current topics can be found on the institute's website.

In the Seminar on Modeling and Simulation in Transportation, current topics related to the microscopic travel modeling software mobiTopp or to new data sources and simulation applications in the field of traffic engineering and traffic flow modeling are dealt with. Information on current topics can be found on the institute's website.

**Module grade calculation**

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

**Annotation**

Not more than one of the two seminars can be selected.

**Workload**

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

- Tendering, Planning and Financing in Public Transport lectures: 30 h
- Information Management for public Mobility Services lectures/exercises: 30 h
- Sustainability in Mobility Systems lectures: 30 h
- Seminar in Transportation: 30 h
- Seminar Modeling and Simulation in Transportation: 30 h

independent study, depending on selected courses:

- preparation and follow-up Tendering, Planning and Financing in Public Transport lectures: 30 h
- examination preparation Tendering, Planning and Financing in Public Transport (selectable partial exam): 30 h
- preparation and follow-up Information Management for public Mobility Services lectures/exercises: 30 h
- preparation accompanying exercises Information Management for public Mobility Services (selectable partial exam): 30 h
- preparation and follow-up Sustainability in Mobility Systems lectures: 30 h
- examination preparation Sustainability in Mobility Systems (selectable partial exam): 30 h
- preparation of seminar paper in Transportation and presentation (selectable partial exam): 60 h
- work on a practical problem in the Seminar on Modeling and Simulation in Transportation (selectable partial exam): 60 h

total: 180 h

**Recommendation**

course Transportation (6200406)

**M****5.10 Module: Seminars on Empirical Research, Modeling and Simulation in Transportation (mobiM209-VERKSEM) [M-BGU-106182]**

**Responsible:** Prof. Dr.-Ing. Peter Vortisch  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Specialization / Urban and Transport Planning](#) (Usage from 10/1/2022)  
[Profile Specialization / Traffic Engineering](#) (Usage from 10/1/2022)  
[Subject-Specific Supplements](#) (Usage from 10/1/2022)

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

Mandatory			
T-BGU-100014	<a href="#">Seminar in Transportation</a>	3 CR	Kagerbauer, Vortisch
T-BGU-112552	<a href="#">Seminar on Modeling and Simulation in Transportation</a>	3 CR	Kagerbauer, Vortisch

**Competence Certificate**

- 'Teilleistung' T-BGU-100014 with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-BGU-112552 with examination of other type according to § 4 Par. 2 No. 3

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

**Prerequisites**

none

**Competence Goal**

Students are able to explain methods of empiricism, modeling and simulation in transportation and apply them to topics in transport planning. They will be able to present complex issues in transportation in writing or in a presentation.

**Content**

In the Seminar in Transportation, current topics from traffic engineering, transport planning and travel behavior research are dealt with on a semester-by-semester basis.

In the Seminar on Modeling and Simulation in Transportation, current topics related to the microscopic travel demand modeling software mobiTopp or to new data sources and simulation applications in the field of traffic engineering and traffic flow modeling are dealt with. Information on current topics can be found on the institute's website.

**Module grade calculation**

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

**Annotation**

Selecting this module no seminars can be selected within the module Special Issues of Public Transport.

**Workload**

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

- Seminar in Transportation: 30 h
- Seminar on Modeling and Simulation in Transportation: 30 h

independent study, depending on selected courses:

- preparation of seminar paper in Transportation and presentation (partial exam): 60 h
- work on a practical problem in the Seminar on Modeling and Simulation in Transportation (partial exam): 60 h

total: 180 h

**Recommendation**

none

**M****5.11 Module: Interdisciplinary Design – Urban and Transportation Planning (mobIM210-INTENTW) [M-BGU-106183]**

**Responsible:** Prof. Dr.-Ing. Barbara Engel  
Prof. Dr.-Ing. Peter Vortisch

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

**Part of:** [Profile Specialization / Urban and Transport Planning](#) (Usage from 4/1/2023)  
[Profile Specialization / Traffic Engineering](#) (Usage from 4/1/2023)  
[Profile Specialization / Highway Engineering](#) (Usage from 4/1/2023)  
[Subject-Specific Supplements](#) (Usage from 4/1/2023)

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

Mandatory			
T-BGU-112555	<a href="#">Interdisciplinary Design – Urban and Transportation Planning</a>	6 CR	Engel, Vortisch

**Competence Certificate**

- 'Teilleistung' T-BGU-112555 with examination of other type according to § 4 Par. 2 No. 3  
details about the learning control see at the 'Teilleistung'

**Prerequisites**

none

**Competence Goal**

Students:

- are able to formulate original ideas and concepts and develop planning and strategies based on them and are able to consistently transform the concept based on multi-layered parameters such as context, program, formal and spatial impact, etc. into a traffic concept or streetscape design within the framework of a structured planning process. In particular, this involves balancing urban planning requirements with traffic planning requirements.
- have the ability to continuously develop and sharpen the original concept as the design progresses and to develop variants from this in the planning process and to be able to compare and evaluate them.
- are able to draw with design confidence on the knowledge they have acquired in the course of their studies about the effects of traffic planning measures, design elements of streetscape design, spatial and programmatic strategies; they are able to apply, modify and further develop these for their own work.
- are able to select and develop the necessary level of detail and appropriate representation and visualization depending on the task, developing their own concise language of presentation in drawing, image and model.
- work in an interdisciplinary manner with other disciplines of planning and develop an understanding of the respective challenges and communication needs.

**Content**

In the course, a planning task is worked on together with architecture students from the field of urban planning. Students create a data basis for sound planning in the context of urban design. The assignments are usually open-ended and require research and original thinking as the basis for concept development. The applied methods include the analysis of the spatial and thematic context, the development of a traffic planning concept on different scale levels taking into account the spatial, functional and constructive structure depending on the theme and typology. For this purpose, the methods learned in the field of traffic planning, traffic engineering and streetscape design are applied. The communication of the results includes the choice of the appropriate representation technique.

**Module grade calculation**

grade of the module is grade of the exam

**Annotation**

The design task is carried out in teams of students of master programs Architecture as well as Mobility and Infrastructure. The module and the associated course can therefore only be offered if a task suitable for interdisciplinary collaboration is available in the respective semester. Therefore, the module can only be offered irregularly. Please inform yourself about the current offer on the website of the Institute of Transportation.

The number of participants in the course is limited to 10 persons. A registration is mandatory. Registration modalities will be published on the institute homepage in due time. If necessary, the places are allocated considering the progress in the students' studies, with priority to students from *Mobility and Infrastructure*. The participation will be confirmed by the end of the first lecture week.

**Workload**

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

- seminar, proofreading sessions, interim presentations, final presentation: 20 h

independent study, depending on selected courses:

- working out the design task in a team: 80 h
- preparing the required deliverables, preparing the final presentation (exam): 80 h

total: 180 h

**Recommendation**

preliminary taking of the modules City Transport Facilities [mobIM304-STRIVA], Models and Methods in Traffic Engineering and Transportation Planning [mobIM201-VERMODELL] or Traffic Management and Simulation Methods [mobIM202-VERMANAGE]



**M****5.12 Module: Infrastructure Management (mobiM301-STRINFRA) [M-BGU-100009]**

**Responsible:** Dr.-Ing. Matthias Zimmermann  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Basics / Traffic Engineering](#)  
[Profile Basics / Highway Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-106300	<a href="#">Infrastructure Management</a>	6 CR	Zimmermann

**Competence Certificate**

- 'Teilleistung' T-BGU-106300 with written examination according to § 4 Par. 2 No. 1  
 details about the learning control see at the respective 'Teilleistung'

**Prerequisites**

none

**Competence Goal**

The graduates are able to apply and develop respectively methods and techniques for different tasks related to the life cycle of a road (design, construction, operation and maintenance) and to examine these with regard to their technical suitability and economic feasibility. Further, they have the competence to be able to apply these methods to other problems and in different fields and modify them respectively.

**Content**

The module addresses further topics about design and construction of roads such as aspects of safety, junctions, construction materials, way of construction and drainage. In the phase of operation of a road after release for traffic logistical and technical aspects of the operation service (road control, snow and ice control, green belt care etc.) as well as the maintenance of roads (status recognition and evaluation, surface and structure properties, pavement management a.o.) come to the fore which are important for smooth and safe traffic flow. These are discussed in the classes fundamentally.

**Module grade calculation**

grade of the module is grade of the exam

**Annotation**

none

**Workload**

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

- Design and Construction of Highways lectures: 30 h
- Operation and Maintenance of Highways lectures: 30 h

independent study:

- preparation and follow-up Design and Construction of Highways lectures: 30 h
- preparation and follow-up Operation and Maintenance of Highways lectures: 30 h
- examination preparation: 60 h

total: 180 h

**Recommendation**

none

**M****5.13 Module: Highway Design (mobiM302-STRENTW) [M-BGU-100017]**

**Responsible:** Dr.-Ing. Matthias Zimmermann  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Basics / Highway Engineering](#)  
[Profile Specialization / Traffic Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-109917	<a href="#">Study Project Design of a Rural Road</a>	2 CR	Zimmermann
T-BGU-100057	<a href="#">Highway Design</a>	4 CR	Zimmermann

**Competence Certificate**

- 'Teilleistung' T-BGU-109917 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite
- 'Teilleistung' T-BGU-100057 with oral examination according to § 4 Par. 2 No. 2

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

**Prerequisites**

none

**Competence Goal**

The graduates can apply methods as well as manual and computer aided procedures for the design of a road in position elevation and cross section and design new roads. Furthermore, they are able to develop and evaluate variants of new roads considering traffic, topographic, ecologic and economic requirements as well as to assess road designs in compliance with the technical regulations.

**Content**

In this module the procedure of finding the route of a bypass road will be discussed and applied to a specific planning example. After defining the boundary conditions for the draft of this bypass road design solutions are developed in the map, in the gradient diagram and in the cross-section manually by small teams. The results are discussed. Here also, tests are made whether the standards are satisfied and related to requirements of the spatial route planning. In parallel to this manual route planning of the road, the procedure of a computer aided road design is addressed in theory as well as practically at basic design examples. The exercises are conducted by use of the both most popular design codes.

**Module grade calculation**

grade of the module is grade of the exam

**Annotation**

none

**Workload**

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

- IT-based Road Design lectures/exercises: 30 h
- Highway Design Project Study lectures/exercises: 30 h

independent study:

- preparation and follow-up IT-based Road Design lectures/exercises: 30 h
- preparation and follow-up Highway Design Project Study lectures/exercises: 30 h
- attestation of study project (examination prerequisite): 20 h
- examination preparation: 40 h

total: 180 h

**Recommendation**

preliminary attendance of the module Infrastructure Management [mobiM301-STRINFRA]

**M****5.14 Module: Road Construction (mobIM303-STRBAUT) [M-BGU-100006]**

**Responsible:** Dr.-Ing. Matthias Zimmermann  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Basics / Highway Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-100058	<a href="#">Road Construction</a>	6 CR	Zimmermann

**Competence Certificate**

- 'Teilleistung' T-BGU-100058 with oral examination according to § 4 Par. 2 No. 2  
 details about the learning control see at the 'Teilleistung'

**Prerequisites**

none

**Competence Goal**

The graduates are able to dimension and to test roadway constructions build of asphalt and concrete empirically and by calculation and to assess the impact of internal and external influencing factors on roadway constructions. Furthermore, they are able to explain mechanisms of failure, to question and to evaluate failures as well as to test material parameters by experimental techniques in the lab.

**Content**

In this module material models, influencing factors on roadway constructions as well as basics and parameters for an empirical and calculatory dimensioning of transportation routes are addressed deeply. Furthermore, deficiencies and failures of roadway constructions are presented and failure mechanisms are explained. In the practical training experiments on the determination of material parameters of unconsolidated materials, bitumen and asphalt are conducted, analysed and evaluated as well as the application of dimensioning methods are examined at real-world examples.

**Module grade calculation**

grade of the module is grade of the exam

**Annotation**

none

**Workload**

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

- Practical Laboratory Training in Road Construction lectures/exercises: 30 h
- Pavement Structural Design and Failure Analysis lectures: 30 h

independent study:

- preparation and follow-up Practical Laboratory Training in Road Construction lectures/exercises: 30 h
- preparation and follow-up Pavement Structural Design and Failure Analysis lectures: 30 h
- examination preparation: 60 h

total: 180 h

**Recommendation**

preliminary attendance of the module Infrastructure Management [mobIM301-STRINFRA]

**M****5.15 Module: City Transport Facilities (mobiM304-STRIVA) [M-BGU-100026]**

**Responsible:** Dr.-Ing. Matthias Zimmermann  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Basics / Traffic Engineering](#)  
[Profile Basics / Highway Engineering](#)  
[Profile Specialization / Urban and Transport Planning](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-109912	<a href="#">Exercises and Student Research Project City Transport Facilities</a>	2 CR	Zimmermann
T-BGU-100083	<a href="#">City Transport Facilities</a>	4 CR	Zimmermann

**Competence Certificate**

- 'Teilleistung' T-BGU-109912 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite
- 'Teilleistung' T-BGU-100083 with oral examination according to § 4 Par. 2 No. 2

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

**Prerequisites**

none

**Competence Goal**

The graduates are able to plan and design city transport facilities related to car, bicycle, pedestrian and public traffic as well as to test, evaluate and optimize existing infrastructure. Further, they are able to assess the different usage requirements of different types of transportation and to consider them appropriately in design planning.

**Content**

Manifold requirements are put on city transport facilities in contrast to overland roads: usage from transit to access traffic, usage for stationary traffic, weak road users such as bicyclist and pedestrians, the demand of moving traffic, for stay and recreation activities up to the designing of the transport facilities considering the cityscape. Contemporarily, a variety of carriers of traffic are found within urban areas which have to be taken into consideration for designing roads and junctions as well as the network of transportation routes. All aspects are covered, discussed and their handling is practised at practically relevant case studies within this module.

**Module grade calculation**

grade of the module is grade of the exam

**Annotation**

none

**Workload**

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

- lectures/exercises: 45 h

independent study:

- preparation and follow-up lectures/exercises: 30 h
- preparation of exercises and student research project (examination prerequisite): 70 h
- examination preparation: 40 h

total: 185 h

**Recommendation**

none

**M****5.16 Module: Road Safety (mobim305-STRVSICH) [M-BGU-100021]**

**Responsible:** Dr.-Ing. Matthias Zimmermann  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Specialization / Traffic Engineering](#)  
[Profile Specialization / Highway Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-109915	<a href="#">Seminar Paper Road Safety</a>	3 CR	Zimmermann
T-BGU-100062	<a href="#">Road Safety</a>	3 CR	Zimmermann

**Competence Certificate**

- 'Teilleistung' T-BGU-109912 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite
- 'Teilleistung' T-BGU-100062 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 graduates are able to apply methods and techniques for the improvement of road safety, to evaluate the safety of road networks, road sections and junctions, to identify accident black spots, to analyse accidents and their causes as well as to develop measures to improve road safety and evaluate them in their effect. Furthermore, they are able to self-organized and have organisational and didactic competences available related to team work and presentations.

**Content**

In this course the theoretical basics of road safety are repeated and fundamental improvements are discussed.

During the following seminar in highway engineering changing regional accident black spots are analysed and improvements for the road authorities are worked out and will be presented.

**Module grade calculation**

grade of the module is grade of the exam

**Annotation**IMPORTANT:

The courses will not be offered in the winter semester 2024/25. In future, they will always be offered in the summer semester.

**Workload**

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

- Safety Management in Highway Engineering lectures/exercises: 30 h
- Seminar in Highway Engineering: 30 h

independent study:

- preparation and follow-up Safety Management in Highway Engineering lectures/exercises: 30 h
- preparation of seminar paper (examination prerequisite): 60 h
- examination preparation: 60 h

total: 180 h

**Recommendation**

none

**M****5.17 Module: Special Topics in Highway Engineering (mobIM306-STRSPEZ) [M-BGU-100022]**

**Responsible:** Dr.-Ing. Matthias Zimmermann  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Specialization / Highway Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-106734	<a href="#">Special Topics in Highway Engineering</a>	6 CR	Hess, Zimmermann

**Competence Certificate**

- 'Teilleistung' T-BGU-106734 with oral examination according to § 4 Par. 2 No. 2  
 details about the learning control see at the 'Teilleistung'

**Prerequisites**

none

**Competence Goal**

The graduates are able to apply methods and techniques for specific aspects in the life cycle of a road, to modify them for the application case and to analyse the obtained knowledge. They are able to investigate the organisation and implementation of the operation and maintenance of a road, for instance, to reveal the weak points and to develop improvement possibilities.

**Content**

In this module the duties of the management of existing roads are acquired and the technical and commercial control from the point of view of the road authorities are explained. Further, different methods for the simulation, analysis and evaluation of additional problems and special aspects in highway engineering are presented and discussed by means of varying topics of design, construction, operation and maintenance of roads (e.g. statistical analysis of large data sets, simulation of traffic flow under particular boundary conditions, construction material analysis in lab experiments, innovative contractual forms for construction and operation of roads, econ. privatization).

**Module grade calculation**

grade of the module is grade of the exam

**Annotation**IMPORTANT:

The module will not be offered in summer term 2025.

**Workload**

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

- Technical and Economic Management Tools in Highway Engineering lectures: 30 h
- Simulations and Analysis Methods in Highway Engineering lectures: 15 h
- Special Topics in Highway Engineering lectures: 15 h

independent study:

- preparation and follow-up Technical and Economic Management Tools in Highway Engineering lectures: 30 h
- preparation and follow-up Simulations and Analysis Methods in Highway Engineering lectures: 15 h
- preparation and follow-up Special Topics in Highway Engineering lectures: 15 h
- examination preparation: 60 h

total: 180 h

**Recommendation**

preliminary attendance of the module Infrastructure Management [mobIM301-STRINFRA]

**M****5.18 Module: Laws and Proceedings Concerning Traffic and Roads (mobIM501-VERFRECHT) [M-BGU-100011]**

**Responsible:** Prof. Dr.-Ing. Peter Vortisch  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Basics / Urban and Transport Planning](#)  
[Profile Basics / Traffic Engineering](#)  
[Profile Basics / Highway Engineering](#)

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

Mandatory			
T-BGU-106297	<a href="#">Laws and Proceedings Concerning Traffic and Roads</a>	6 CR	Vortisch, Zimmermann

**Competence Certificate**

- 'Teilleistung' T-BGU-100050 with written examination according to § 4 Par. 2 No. 1  
 details about the learning control see at the 'Teilleistung'

**Prerequisites**

none

**Competence Goal**

The graduates know the legal framework concerning construction and operating of roads and can justify and question decisions. Furthermore, they understand methods concerning environmental impact analysis of infrastructure, they can technically argue and classify evaluations of variants. In addition, they are able to apply assessment and evaluation techniques for the planning of infrastructure projects, to modify them with respect to specific applications and to analyse their results.

**Content**

Constitutional framework, environmental impact of roads, changing topics concerning mainly procedures in highway engineering Methodologies and application of standardized assessment and decision techniques (Cost-Benefit-Analyses, Value Benefit Analysis etc.) in transport planning

**Module grade calculation**

grade of the module is grade of the exam

**Annotation**

none

**Workload**

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

- Laws concerning Traffic and Roads lectures: 30 h
- Environmental Impact Assessment lectures: 15 h
- Assessment and Evaluation Techniques lectures: 15 h

independent study:

- preparation and follow-up Laws concerning Traffic and Roads lectures: 30 h
- preparation and follow-up Environmental Impact Assessment lectures: 15 h
- preparation and follow-up Assessment and Evaluation Techniques lectures: 15 h
- examination preparation: 60 h

total: 180 h

**Recommendation**

none



**M****5.19 Module: Project Integrated Planning (mobiM502-PROJEKTIP) [M-BGU-100018]**

**Responsible:** Prof. Dr.-Ing. Peter Vortisch  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [Profile Specialization / Urban and Transport Planning](#)  
[Profile Specialization / Traffic Engineering](#)  
[Profile Specialization / Highway Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-109916	<a href="#">Group Exercise Project Integrated Planning</a>	5 CR	Vortisch, Zimmermann
T-BGU-100061	<a href="#">Project Integrated Planning</a>	1 CR	Vortisch, Zimmermann

**Competence Certificate**

- 'Teilleistung' T-BGU-109916 with not graded accomplishment according to § 4 Par. 3 as examination prerequisite
- 'Teilleistung' T-BGU-100061 with oral examination according to § 4 Par. 2 No. 2

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

**Prerequisites**

none

**Competence Goal**

The graduates are able to analyze the planning requirements of the different subject areas in the field mobility and infrastructure and to apply them to a specific example. They identify the weak points, develop realizable solutions and discuss them in the framework of a multi-disciplinary weighing process. Furthermore, they can work self-organized and have organisational and didactic competences with respect to team work and presentation.

**Content**

A typical practical task in the field of spatial and infrastructure planning has to be elaborated (e.g. ideas contest in town planning). The students have to take charge of certain planning tasks from the fields town planning, transport studies, highway engineering and track guided transport systems and develop different solution concepts based on a conflict and deficiency analysis. In order to obtain an integrated planning concept the requirements of the involved subject areas have to be considered. Subsequent to a weighing process, they select well-founded a acceptable and sustainable concept which they develop further and present in 3 phases to a realizable solution on different levels of detail.

**Module grade calculation**

grade of the module is grade of the exam

**Annotation**

none

**Workload**

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

- on-site meeting, technical group meetings, presentations: 15 h

independent study:

- preparation and follow-up: 15 h
- team exercise (examination prerequisite, part per person): 135 h
- examination preparation and examination: 15 h

total: 180 h

**Recommendation**

preliminary attendance of at least 2 compulsory modules in the selected profile

**M****5.20 Module: Urban Design in Practice (mobiM601-PRAXSTB) [M-ARCH-100029]**

**Responsible:** Prof. Dr.-Ing. Barbara Engel  
**Organisation:** KIT Department of Architecture  
**Part of:** [Profile Specialization / Urban and Transport Planning](#)  
[Subject-Specific Supplements](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	2 terms	German	4	7

Mandatory			
T-ARCH-111657	<a href="#">Basic Concepts of Urban Development and Urban Planning</a>	2 CR	Neppl
T-ARCH-106581	<a href="#">Fundamentals of Town Planning</a>	4 CR	Bava, Engel

**Competence Certificate**

- 'Teilleistung' T-ARCH-111657 with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-ARCH-106581 with oral examination according to § 4 Par. 2 No. 2

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

**Prerequisites**

This module must not be selected together with the module Specialization Urban Design [mobiM608-VERTSTB].

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The module [M-ARCH-106310 - Specialization Urban Design](#) must not have been started.

**Competence Goal**

The students:

- can define and classify the basic terms of urban development and urban planning.
- are familiar with the relevant issues and approaches to urban planning projects at different scales.
- have a repertoire of different project examples from different eras.
- know the main features and systematics of formal and informal instruments of urban planning.
- can identify the different groups of actors and the basic conflicts of interest.
- know the basic principles of planning tools for controlling the type and extent of building use.
- know the basics for the design of streets and squares.
- are able to apply urban development methods and can critically assess various different design and planning approaches.
- can avail of planning and design basic knowledge regarding various scale levels and in the following thematic fields: urban morphologies and typologies, urban ecology, free spaces, transport/infrastructure, legal aspects, urban analysis, connect development and design

**Content**

The lecture "Basic Concepts of Urban Design and Urban Planning" provides an overview of the current topics and backgrounds of urban development and thus enables an entry into the current debate about the future of our urban lifestyles. In order to be able to make a relevant contribution to these social discussions, the terms necessary for effective communication must be clearly classified and mastered in terms of content.

In the course "Basics of Urban Planning" the basics regarding the thematic fields urban development, urban and regional planning as well as landscape planning are taught. Tools are introduced for urban planning structure analysis, concept development and urban planning design which are gone into in-depth within the framework of a mandatory excursion. In addition, basic knowledge on the designing of urban planning and town maps as well as scales and the introduction to portrayal and presentation techniques are the contents of this course.

**Module grade calculation**

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

**Annotation**

With a mandatory excursion.

**Workload**

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

- Fundamentals of Town Planning lectures: 60 h
- Urban Development: Urban Perspectives Basic Concepts of Urban Design and Planning lectures: 30 h

independent study:

- preparation and follow-up Fundamentals of Town Planning lectures: 30 h
- examination preparation Fundamentals of Town Planning (partial examination): 30 h
- preparation and follow-up Urban Development: Urban Perspectives Basic Concepts of Urban Design and Planning lectures: 10 h
- examination preparation Urban Development: Urban Perspectives Basic Concepts of Urban Design and Planning (partial examination): 20 h

total: 180 h

**Recommendation**

none

**M****5.21 Module: 2D/3D Image Analysis and Image Based Tracking Methods (mobiM602-BILDANAL) [M-BGU-100674]****Responsible:** Prof. Dr.-Ing. Stefan Hinz**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [Profile Specialization / Traffic Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-BGU-101166	<a href="#">Basics in Computer Vision (2D/3D)</a>	3 CR	Ulrich
T-BGU-101167	<a href="#">Image Sequence Analysis</a>	3 CR	Hinz

**Competence Certificate**

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

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

**Prerequisites**

none

**Module grade calculation**

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

**Annotation**

none

**Workload**

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

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

independent study:

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

total: 180 h

**Recommendation**

none

**M****5.22 Module: Network Economics (mobim603-NETZÖKON) [M-WIWI-100032]**

**Responsible:** Prof. Dr. Kay Mitusch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Profile Specialization / Urban and Transport Planning](#)  
[Subject-Specific Supplements](#)

**Credits**  
6

**Grading scale**  
Grade to a tenth

**Recurrence**  
Each term

**Duration**  
2 terms

**Level**  
4

**Version**  
1

Mandatory			
T-WIWI-100005	<a href="#">Competition in Networks</a>	3 CR	Mitusch
T-WIWI-100007	<a href="#">Transport Economics</a>	3 CR	Mitusch, Szimba

**Competence Certificate**

- 'Teilleistung' T-WIWI-100005 with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-WIWI-100007 with written examination according to § 4 Par. 2 No. 1

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

**Prerequisites**

none

**Module grade calculation**

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

**Workload**

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

- Transport Economics lectures/exercises: 45 h
- Competition in Networks lectures/exercises: 45 h

independent study:

- preparation and follow-up Transport Economics lectures/exercises: 15 h
- examination preparation Transport Economics: 30 h
- preparation and follow-up Competition in Networks lectures/exercises: 15 h
- examination preparation Competition in Networks: 30 h

total: 180 h

**Recommendation**

none

**M****5.23 Module: Automotive Engineering (mobiM604-FZGTECH) [M-MACH-100027]****Responsible:** Prof. Dr.-Ing. Marcus Geimer**Organisation:** KIT Department of Mechanical Engineering**Part of:** [Profile Specialization / Traffic Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-MACH-100092	<a href="#">Automotive Engineering I</a>	6 CR	Gießler

**Competence Certificate**

- 'Teilleistung' T-MACH-100092 with written examination according to § 4 Par. 2 No. 1  
details about the learning control see at the respective 'Teilleistung'

**Prerequisites**

none

**Competence Goal**

The student

- knows the most important components of a vehicle,
- knows and understands the functioning and the interaction of the individual components,
- knows the basics of dimensioning the components.

**Content**

In the module Automotive Engineering the basics are taught, which are important for the development, the design, the production and the operation of vehicles. Particularly the primary important aggregates like engine, gear and drive train are explained, but also technical equipment, which make the operation safer and easier.

In the module Automotive Engineering the focus is on passenger cars and commercial vehicles, which are designed for road applications.

**Module grade calculation**

grade of module is grade of examination

**Workload**

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

- lectures, exercises: 60 h

independent study:

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

total: 180 h

**Recommendation**

none

**M****5.24 Module: Algorithms I (mobiM605-ALGO I) [M-INFO-100030]**

**Responsible:** TT-Prof. Dr. Thomas Bläsius  
**Organisation:** KIT Department of Informatics  
**Part of:** [Profile Specialization / Traffic Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-INFO-100001	<a href="#">Algorithms I</a>	6 CR	Bläsius

**Competence Certificate**

(kein Eintrag) Mobilität und Infrastruktur Master 2013

- 'Teilleistung' T-INFO-100001 with written examination according to § 4 Par. 2 No. 2  
 details about the learning control see at the respective 'Teilleistung'

**Prerequisites**

none

**Module grade calculation**

grade of module is grade of examination

**Workload**

(kein Eintrag) Mobilität und Infrastruktur Master 2013

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

- lectures, exercises: 60 h

independent study:

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

total: 180 h

**Recommendation**

none



**M****5.25 Module: Algorithms for Routing (mobiM606-ALGOROUT) [M-INFO-100031]**

**Responsible:** TT-Prof. Dr. Thomas Bläsius  
**Organisation:** KIT Department of Informatics  
**Part of:** [Profile Specialization / Traffic Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-INFO-100002	<a href="#">Algorithms for Routing</a>	6 CR	Bläsius

**Competence Certificate**

- 'Teilleistung' T-INFO-100002 with oral examination according to § 4 Par. 2 No. 2  
 details about the learning control see at the respective 'Teilleistung'

**Prerequisites**

none

**Module grade calculation**

grade of module is grade of examination

**Workload**

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

- lectures, exercises: 45 h

independent study:

- preparation and follow-up lectures, exercises: 75 h
- examination preparation: 60 h

total: 180 h

**Recommendation**

taking the module Algorithms I [mobiM605-ALGO-I]

**M****5.26 Module: Technology of Rail Vehicles (mobiM607-SCHIENENFZG) [M-MACH-100028]****Responsible:** Prof. Dr.-Ing. Martin Cichon**Organisation:** KIT Department of Mechanical Engineering**Part of:** [Profile Specialization / Traffic Engineering](#)  
[Subject-Specific Supplements](#)

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

Mandatory			
T-MACH-100082	<a href="#">Technology of Rail Vehicles</a>	6 CR	Cichon

**Competence Certificate**

- 'Teilleistung' T-MACH-100082 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 understand relations and interdependencies between rail vehicles, infrastructure and operation in a rail system.
- Based on operating requirements and legal framework they derive the requirements concerning a capable infrastructure and suitable concepts of rail vehicles.
- They recognize the impact of alignment, understand the important function of the wheel-rail-contact and estimate the impact of driving dynamics on the operating program.
- The students learn the role of rail vehicles and understand their classification. They understand the basic structure and know the functions of the main systems. They understand the overall tasks of vehicle system technology.
- They learn functions and requirements of car bodies and judge advantages and disadvantages of design principles. They know the functions of the car body's interfaces.
- They know about the basics of running dynamics and bogies.
- The students learn about advantages and disadvantages of different types of traction drives and judge, which one fits best for each application.
- They understand brakes from a vehicular and an operational point of view. They assess the fitness of different brake systems.
- They know the basic setup of train control management system and understand the most important functions.
- They specify and define suitable vehicle concepts based on requirements for modern rail vehicles.

**Content**

1. Railway System: railway as system, subsystems and interdependencies, definitions, laws, rules, railway and environment, economic impact
2. Operation: Transportation, public transport, regional transport, long-distance transport, freight service, scheduling
3. Infrastructure: rail facilities, track alignment, railway stations, clearance diagram
4. Wheel-rail-contact: carrying of vehicle mass, adhesion, wheel guidance, current return
5. Vehicle dynamics: tractive and brake effort, driving resistance, inertial force, load cycles
6. Vehicle system technology: structure and main systems of rail vehicles
7. Car body: functions, requirements, design principles, crash elements, coupling, doors and windows
8. Bogies: forces, running gears, bogies, Jakobs-bogies, active components, connection to car body, wheel arrangement
9. Drives: principles, electric drives (main components, asynchronous traction motor, inverter, with DC supply, with AC supply, without line supply, multisystem vehicles, dual mode vehicles, hybrid vehicles), non-electric drives
10. Brakes: basics, principles (wheel brakes, rail brakes, blending), brake control (requirements and operation modes, pneumatic brake, electropneumatic brake, emergency brake, parking brake)
11. Train control management system: definition of TCMS, bus systems, components, network architectures, examples, future trends
12. Vehicle concepts: trams, metros, regional trains, intercity trains, high speed trains, double deck vehicles, locomotives, freight wagons

**Module grade calculation**

grade of module is grade of examination

**Annotation**

A bibliography is available for download (Ilias-platform).

This module comprises the entire lecture "Rail Vehicle Technology" and chapter 1 to 5 of the lecture "Rail System Technology".

**Workload**

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

- Rail Vehicle Technology lectures: 30 h
- Rail System Technology lectures: 15 h

independent study:

- preparation and follow-up Rail Vehicle Technology lectures: 30 h
- preparation and follow-up Rail System Technology lectures: 15 h
- examination preparation: 90 h

total: 180 h

**Recommendation**

none

**Learning type**

Lectures

**M****5.27 Module: Specialization Urban Design (mobiM608-VERTSTB) [M-ARCH-106310]****Responsible:** Prof. Dr.-Ing. Barbara Engel**Organisation:** KIT Department of Architecture**Part of:** [Profile Specialization / Urban and Transport Planning](#) (Usage from 4/1/2023)  
[Subject-Specific Supplements](#) (Usage from 4/1/2023)**Credits**  
8**Grading scale**  
Grade to a tenth**Recurrence**  
Each term**Duration**  
1 term**Language**  
German/English**Level**  
4**Version**  
1**Election notes**

Two parts must be selected.

Teilleistungen (Election: at most 2 items)			
T-ARCH-107411	<a href="#">Methods, Strategies and Mechanisms of Urban Design</a>	4 CR	Engel
T-ARCH-107377	<a href="#">City Theory</a>	4 CR	Engel
T-ARCH-107374	<a href="#">Urban Typologies</a>	4 CR	Neppl
T-ARCH-107375	<a href="#">Quarter Analysis</a>	4 CR	Neppl
T-ARCH-107376	<a href="#">International Urban Design</a>	4 CR	Engel
T-ARCH-107409	<a href="#">Special Topics of Urban Design</a>	4 CR	Bava, Engel, Inderbitzin, Neppl

**Competence Certificate**

two learning controls have to be selected:

- 'Teilleistung' T-ARCH-107411 with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-ARCH-107377 with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-ARCH-107374 with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-ARCH-107375 with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-ARCH-107376 with examination of other type according to § 4 Par. 2 No. 3
- 'Teilleistung' T-ARCH-107409 with examination of other type according to § 4 Par. 2 No. 3

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

**Prerequisites**

This module must not be selected together with the module Urban Design in Practice [mobiM601-PRAXSTB].

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The module [M-ARCH-100029 - Urban Design in Practice](#) must not have been started.

**Competence Goal**

The students:

**Methods, Strategies and Mechanisms of Urban Design**

- can comprehend, describe and assess the given problems and tasks at hand that stem from the various planning phases.
- are able to apply, from a spectrum of the instruments and methods they have learned about, the fitting tools for the respective question or topic being worked on, with relation to the planning time and date as well as planning strategy, measurements, type and scope of the task set, urban technology, economic and sociological urban aspects and all in relation to the concept selected.

**City Theory**

- have knowledge of the current urban planning discourses, conditions and tendencies of the current debate going on with regard to urban development. They understand the manifold roles of planning and planners within society.
- have the ability to critically analyze and reflect on conceptual urban models and strategies and can use these for the problems facing today's urban planning world.
- can, based on various different historical and contemporary understandings of space as social space, built-up space and free space, formulate the requirements regarding the development of urban spaces.
- are capable of working independently in a scientific manner and are able to work out their own position to a topic and to be able to present this specialized knowledge within a fitting framework.

**International Urban Design**

- have knowledge of international urban planning phenomena, urban types in various different cultural and social circles as well as an insight into the current transformation processes of urban systems. They understand complex relationships affecting all of society as well as their influences on urban development.
- can interpret order and design principles of urban planning against the background of guiding social principles and paradigms.
- are capable of working independently in a scientific manner and are able to work out their own position to a topic and to be able to present this specialized knowledge within a fitting framework.

**Quarter Analysis**

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

**Urban Typologies**

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

**Special Topics of Urban Design**

- have a sound vocabulary of urban planning and specialist terms.
- are able to consistently adapt their working methodology based on multi-layered and partly contradictory influencing factors such as housing trends, mobility, climate, resources, social processes, etc. within the framework of a structured working process.
- possess basic knowledge of scientific work and are able to develop their own positions on the topic. They can present this expertise in a suitable form.

**Content****Methods, Strategies and Mechanisms of Urban Design**

The focus of the seminar is on the methods and tools of urban planning as well as the formats of communication of and participation in planning processes. Here especially the aspects of sociology, urban technology and urban economics are taken into account. Based on current as well as historical examples, various methods – going from top-down to bottom-up – are examined as to their applicability at various scale levels and at different time periods during the design and planning processes. The strategies discussed are comparatively analyzed, tested and experimented with by the students during a series of practical work assignments and exercises.

**City Theory**

The focus of the urban theory seminar is on dealing with processes and debates which are going on in the backdrop behind the spatial phenomena and developments that are taking place. In this seminar the knowledge of various different planning processes and methods, participation as well as democracy regarding planning in local and/or international contexts is taught and critically evaluated.

**International Urban Design**

In the focus of the urban planning seminar is documentation work as well as critical analysis and the students own evaluation of spatial and design-related aspects regarding cities within a local and/or an international context. Taught and worked on is extensive knowledge on economic, social, political, ecological and spatial relationships of urban development in European as well as non-European cities.

**Quarter Analysis**

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

**Urban Typologies**

Analysis and systematization of various different building development and usage structures. Analysis of examples of different typologies from a historical and a modern context. In-depth look at the usage foci residential living.

Basics of the layouts and floor plans of both residential and office buildings. Teaching development systems for different typologies. Working out an example of a hybrid residential and office building.

**Special Topics of Urban Design**

The content of the module is the examination of the various historical, social, technical, structural, traffic, urban or housing policy or open space aspects of an urban space or region.

**Module grade calculation**

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

**Annotation**

The individual courses are offered irregularly. The respective offer and the topics can be taken from the course catalog. It is also marked there if a course is not suitable for this degree program.

Attention:

The registration for the lectures is always in the week before the lecture starts. More detailed information about the lecture procedures and registration deadlines can be found on the homepage of the KIT Faculty of Architecture in the weeks prior to the lecture: [www.arch.kit.edu](http://www.arch.kit.edu)

Possibly with compulsory excursion.

**Workload**

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

- Methods, Strategies and Mechanisms of Urban Design seminar: 30 h
- City Theory seminar: 30 h
- Urban Typologies seminar: 30 h
- Quarter Analysis seminar: 60 h
- International Urban Design seminar: 30 h
- Special Topics of Urban Design seminar: 30 h

independent study, depending on selected courses:

- preparation seminar paper Methods, Strategies and Mechanisms of Urban Design (selectable partial exam): 90 h
- preparation seminar paper, presentation City Theory (selectable partial exam): 90 h
- preparation project work, presentation Urban Typologies (selectable partial exam): 90 h
- preparation analysis, presentation Quarter Analysis (selectable partial exam): 60 h
- preparation seminar paper, presentation International Urban Design (selectable partial exam): 90 h
- preparation seminar paper, presentation Special Topics of Urban Design (selectable partial exam): 90 h

total: 240 h

**Recommendation**

This module is suitable for students who have already acquired basic knowledge of urban planning in their bachelor's degree program.



**M****5.28 Module: Mobility- and Vehicle-Systems for Rail and Road Transport (mobiM609-BAHNSYS) [M-MACH-106639]****Responsible:** Prof. Dr.-Ing. Martin Cichon**Organisation:** KIT Department of Mechanical Engineering**Part of:** [Profile Specialization / Traffic Engineering](#) (Usage from 4/1/2024)  
[Subject-Specific Supplements](#) (Usage from 4/1/2024)

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

Mobility- and Vehicle-Systems for Rail and Road Transport (Election: 2 items)			
T-MACH-105540	<a href="#">Railways in the Transportation Market</a>	4 CR	Cichon
T-MACH-113016	<a href="#">Digitization in the Railway System</a>	4 CR	Cichon
T-MACH-113069	<a href="#">Vehicle Systems for Urban Mobility</a>	4 CR	Cichon
T-MACH-113068	<a href="#">Innovation and Project Management in Rail Vehicle Engineering</a>	4 CR	Cichon

**Competence Certificate**

two learning controls have to be selected:

- 'Teilleistung' T-MACH-105540 with examination of other type according to § 4 Par. 2 No. 2
- 'Teilleistung' T-MACH-113016 with examination of other type according to § 4 Par. 2 No. 2
- 'Teilleistung' T-MACH-113069 with examination of other type according to § 4 Par. 2 No. 2
- 'Teilleistung' T-MACH-113068 with examination of other type according to § 4 Par. 2 No. 3

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

**Prerequisites**

none

**Competence Goal****Depending on the choice of course:**

- Students learn to grasp the entrepreneurial perspective of transport and infrastructure companies, to assess the intra- and intermodal competitive situation, to reflect on trends in the transport market and to apply a cross-modal perspective. They should recognize the relevance of sustainability and digitalization for companies.
- Students will have a basic understanding of train protection and its technical implementation in Germany, the functioning of the European Train Control System (ETCS) and its planning as well as Automated Train Operation. They can explain the knowledge they have learned (terms, relationships) in context and apply it to practical issues. Furthermore, students will be able to classify the operational and technical advantages and disadvantages in the context of the digitalization of the rail network in Germany and take future challenges into account. students will be able to discuss the technical aspects and areas of application of ETCS at the various levels and give a basic outline of balise planning for ETCS Level 2. Digital planning approaches such as PlanPro as well as measurement and test runs are known and can be categorized.
- Students gain a basic understanding of the key transport, transport policy and technological contexts of urban mobility. Based on this basic understanding, various public transport vehicle concepts in the urban and regional environment are analyzed, compared and the optimal range of applications discussed. In addition to established public transport systems, special attention is paid to innovative mobility solutions. In particular, the aim is to create an understanding of how sustainable, systemic mobility solutions should be designed depending on the individual application.
- In this course, students will learn the basics of innovation and project management in the context of rail vehicle development. Creativity techniques are applied to the challenges of the rail system in a practical way, such as aspects of sustainability. Students will also learn about the various organizational, systemic, economic and technological challenges of a project and project management.

**Content**

depends on the choice of course, contents can be found in the individual partial performances.

**Module grade calculation**

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

**Annotation**

Two of the four courses are selected in the module.

Please note: not all lectures offered take place every semester.

### **Workload**

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

- Railways in the Transportation Market block course: 21 h
- Digitization in the Railway System lecture: 30 h
- Vehicle Systems for Urban Mobility lecture: 30 h
- Innovation and Project Management with Case Study 'Innovative Rail Vehicle' lecture: 30 h

independent study, depending on selected courses:

- follow-up block course and examination preparation Railways in the Transportation Market (selectable partial exam): 90 h
- preparation and follow-up lectures Digitization in the Railway System: 30 h
- examination preparation Digitization in the Railway System (selectable partial exam): 60 h
- preparation and follow-up lectures Vehicle Systems for Urban Mobility: 30 h
- examination preparation Vehicle Systems for Urban Mobility (selectable partial exam): 60 h
- preparation and follow-up lectures Innovation and Project Management with Case Study 'Innovative Rail Vehicle': 30 h
- preparation pitch presentation Innovation and Project Management with Case Study 'Innovative Rail Vehicle' (selectable partial exam): 60 h

total: 231-240 h

### **Recommendation**

none

**M****5.29 Module: Module Master's Thesis (mobMSC-THESIS) [M-BGU-105164]**

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

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

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

**Credits**  
30

**Grading scale**  
Grade to a tenth

**Recurrence**  
Each term

**Duration**  
1 term

**Language**  
German/English

**Level**  
5

**Version**  
1

Mandatory			
T-BGU-110432	<a href="#">Master's Thesis</a>	30 CR	Studiendekan:in der KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften

**Competence Certificate**

thesis and final presentation according to § 14 ER/SPO

**Prerequisites**

Modules in extent of minimum 42 CP has to be passed in order to be admitted to the Master Thesis according to ER/SPO § 14 Par. 1. Results obtained in the module Key Competences [mobIMW0-UEQUAL] cannot be counted for this purpose.

**Competence Goal**

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

**Content**

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

**Module grade calculation**

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

**Annotation**

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

**Workload**

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

total: 900 h

**Recommendation**

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

**M****5.30 Module: Interdisciplinary Qualifications (mobiMW0-UEQUAL) [M-BGU-105163]****Responsible:** Studiendekan:in der KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [Interdisciplinary Qualifications](#)

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

**Election notes**

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

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

Interdisciplinary Qualifications (Election: at least 6 credits)			
T-BGU-106765	<a href="#">Introduction to Matlab</a>	3 CR	Ehret
T-BGU-112598	<a href="#">Introduction to Python</a>	3 CR	Cermak, Fuchs
T-BGU-111641	<a href="#">Self Assignment HoC-FORUM-SpZ 1 not graded</a>	2 CR	
T-BGU-111642	<a href="#">Self Assignment HoC-FORUM-SpZ 2 not graded</a>	2 CR	
T-BGU-111643	<a href="#">Self Assignment HoC-FORUM-SpZ 3 not graded</a>	2 CR	
T-BGU-112840	<a href="#">Self Assignment HoC-FORUM-SpZ 7 not graded</a>	2 CR	
T-BGU-111644	<a href="#">Self Assignment HoC-FORUM-SpZ 4 graded</a>	2 CR	
T-BGU-111645	<a href="#">Self Assignment HoC-FORUM-SpZ 5 graded</a>	2 CR	
T-BGU-111646	<a href="#">Self Assignment HoC-FORUM-SpZ 6 graded</a>	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 'General Studies. Forum Science and Society' (FORUM, formerly 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 FORUM ([https://www.forum.kit.edu/english/general\\_studies.php](https://www.forum.kit.edu/english/general_studies.php)). Further, courses of the General Studies of FORUM (formerly ZAK) or language courses of the 'Sprachenzentrums' (<https://www.spz.kit.edu/index.php>; in German) can be taken as Interdisciplinary Qualifications.

**Module grade calculation**

not graded

**Annotation**

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

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

**Workload**

according to taken courses; see course description of HoC, lecture descriptions of FORUM (formerly ZAK), descriptions of language courses

**Recommendation**

none

**M****5.31 Module: Further Examinations (mobIMZL) [M-BGU-102478]**

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

**Part of:** [Additional Examinations](#)

**Credits**  
30

**Grading scale**  
pass/fail

**Recurrence**  
Each term

**Duration**  
2 terms

**Language**  
German

**Level**  
4

**Version**  
2

**M****5.32 Module: Supplementary Studies on Science, Technology and Society [M-FORUM-106753]**

**Responsible:** Dr. Christine Mielke  
Christine Myglas

**Organisation:**

**Part of:** [Additional Examinations](#) (Usage from 10/1/2024)

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

**Election notes**

Students have to self-record the achievements obtained in the Supplementary Studies on Science, Technology and Society in their study plan. FORUM (formerly 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 FORUM homepage at <https://www.forum.kit.edu/english/>. The title of the examination and the amount of credits override the modules placeholders.

If you want to use FORUM achievements for both your Interdisciplinary Qualifications and for the Supplementary Studies, please record them in the Interdisciplinary Qualifications first. You can then get in contact with the FORUM study services ([stg@forum.kit.edu](mailto:stg@forum.kit.edu)) to also record them in your Supplementary Studies.

In the Advanced Unit you can choose examinations from three subject areas: "About Knowledge and Science", "Science in Society" and "Science in Social Debates". It is advised to complete courses from each of the three subject areas in the Advanced Unit.

To self-record achievements in the Advanced Unit, you have to select a free placeholder partial examination first. The placeholders' title do *not* affect which achievements the placeholder can be used for!

<b>Mandatory</b>			
T-FORUM-113578	<a href="#">Lecture Series Supplementary Studies on Science, Technology and Society - Self Registration</a>	2 CR	Mielke, Myglas
T-FORUM-113579	<a href="#">Basic Seminar Supplementary Studies on Science, Technology and Society - Self Registration</a>	2 CR	Mielke, Myglas
<b>Advanced Unit Supplementary Studies on Science, Technology and Society (Election: at least 12 credits)</b>			
T-FORUM-113580	<a href="#">Elective Specialization Supplementary Studies on Science, Technology and Society / About Knowledge and Science - Self-Registration</a>	3 CR	Mielke, Myglas
T-FORUM-113581	<a href="#">Elective Specialization Supplementary Studies on Science, Technology and Society / Science in Society - Self-Registration</a>	3 CR	Mielke, Myglas
T-FORUM-113582	<a href="#">Elective Specialization Supplementary Studies on Science, Technology and Society / Science in Public Debates - Self Registration</a>	3 CR	Mielke, Myglas
<b>Mandatory</b>			
T-FORUM-113587	<a href="#">Registration for Certificate Issuance - Supplementary Studies on Science, Technology and Society</a>	0 CR	Mielke, Myglas

**Competence Certificate**

The monitoring is explained in the respective partial achievement.

They are composed of:

- Protocols
- Reflection reports
- Presentations
- Preparation of a project work
- An individual term paper
- An oral examination
- A written exam

Upon successful completion of the supplementary studies, graduates receive a graded report and a certificate issued by the FORUM.



**Prerequisites**

The course is offered during the course of study and does not have to be completed within a defined period. Enrollment is required for all assessments of the modules in 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 booking a performance themselves. Registration for courses, assessments, and exams is regulated by § 8 of the statutes and is usually possible shortly before the start of the semester.

The course catalog, module description (module manual), statutes (study regulations), and guidelines for creating the various written performance requirements can be downloaded from the FORUM homepage at <https://www.forum.kit.edu/begleitstudium-wtg.php>.

**Registration and exam modalities****PLEASE NOTE:**

Registration on the FORUM, i.e. additionally via the module selection in the student portal, enables students to receive up-to-date information about courses or study modalities. In addition, registering on the FORUM ensures that you have proof of the credits you have earned. As it is currently (as of winter semester 24-25) not yet possible to continue additional credits acquired in the Bachelor's programme electronically in the Master's programme, we strongly advise you to digitally secure the credits you have earned by archiving the Bachelor's transcript of records yourself and by registering on FORUM.

In the event that a transcript of records of the Bachelor's certificate is no longer available - we can only assign the achievements of registered students and thus take them into account when issuing the certificate.

**Competence Goal**

Graduates of the Supplementary Studies on Science, Technology, and Society gain a solid foundation in understanding the interplay between science, the public, business, and politics. They develop practical skills essential for careers in media, political consulting, or research management. The program prepares them to foster innovation, influence social processes, and engage in dialogue with political and societal entities. Participants are introduced to interdisciplinary perspectives, encompassing social sciences and humanities, to enhance their understanding of science, technology, and society. The teaching objectives of this supplementary degree program include equipping participants with both subject-specific knowledge and insights from epistemological, economic, social, cultural, and psychological perspectives on scientific knowledge and its application in various sectors. Students are trained to critically assess and balance the implications of their actions at the intersection of science and society. This training prepares them for roles as students, researchers, future decision-makers, and active members of society.

Through the program, participants learn to contextualize in-depth content within broader frameworks, independently analyze and evaluate selected course materials, and communicate their findings effectively in both written and oral formats. Graduates are adept at analyzing social issues and problem areas, reflecting on them critically from a socially responsible and sustainable standpoint.

## Content

The Supplementary Studies on Science, Technology and Society can be started in the 1st semester of the enrolled degree programme and is not limited in time. The wide range of courses offered by FORUM makes it possible to complete the program usually within three semesters. The supplementary studies comprises 16 or more credit points (LP). It consists of **two modules: the Basic Module (4 LP) and the Advanced Module (12 LP)**.

The **basic Module** comprises the compulsory courses 'Lecture Series Supplementary Studies on Science, Technology and Society' and a basic seminar with a total of 4 LP.

The **Advanced Module** comprises courses totalling 12 LP in the humanities and social sciences subject areas 'On Knowledge and Science', 'Science in Society' and 'Science in Public Debates'. The allocation of courses to the accompanying study programme can be found on the homepage <https://www.forum.kit.edu/wtg-aktuell> and in the printed FORUM course catalogue.

The 3 thematic subject areas:

### Subject area 1: About Knowledge and Science

This is about the internal perspective of science: students explore the creation of knowledge, distinguishing between scientific and non-scientific statements (e.g., beliefs, pseudo-scientific claims, ideological statements), and examining the prerequisites, goals, and methods of knowledge generation. They investigate how researchers address their own biases, analyze the structure of scientific explanatory and forecasting models in various disciplines, and learn about the mechanisms of scientific quality assurance.

After completing courses in the "Knowledge and Science" area, students can critically reflect on the ideals and realities of contemporary science. They will be able to address questions such as: How robust is scientific knowledge? What are the capabilities and limitations of predictive models? How effective is quality assurance in science, and how can it be improved? What types of questions can science answer, and what questions remain beyond its scope?

### Subject area 2: Science in Society

This focuses on the interactions between science and different areas of society, such as how scientific knowledge influences social decision-making and how social demands impact scientific research. Students learn about the specific functional logics of various societal sectors and, based on this understanding, estimate where conflicts of goals and actions might arise in transfer processes—for example, between science and business, science and politics, or science and journalism. Typical questions in this subject area include: How and under what conditions does an innovation emerge from a scientific discovery? How does scientific policy advice work? How do business and politics influence science, and when is this problematic? According to which criteria do journalists incorporate scientific findings into media reporting? Where does hostility towards science originate, and how can social trust in science be strengthened?

After completing courses in the "Science in Society" area, students can understand and assess the goals and constraints of actors in different societal sectors. This equips them to adopt various perspectives of communication and action partners in transfer processes and to act competently at various social interfaces with research in their professional lives.

### Subject area 3: Science in Public Debates

The courses in this subject area provide insights into current debates on major social issues such as sustainability, digitalization, artificial intelligence, gender equality, social justice, and educational opportunities. Public debates on complex challenges are often polarized, leading to oversimplifications, defamation, or ideological thinking. This can hinder effective social solution-finding processes and alienate people from the political process and from science. Debates about sustainable development are particularly affected, as they involve a wide range of scientific and technological knowledge in both problem diagnosis (e.g., loss of biodiversity, climate change, resource consumption) and solution development (e.g., nature conservation, CCS, circular economy).

By attending courses in "Science in Public Debates," students are trained in an application-oriented way to engage in factual debates—exchanging arguments, addressing their own prejudices, and handling contradictory information. They learn that factual debates can often be conducted more deeply and with more nuance than is often seen in public discourse. This training enables them to handle specific factual issues in their professional lives independently of their own biases and to be open to differentiated, fact-rich arguments.

### Supplementary credits:

Additional LP (supplementary work) totalling a maximum of 12 LP can also be acquired from the complementary study programme (see statutes for the WTG complementary study programme § 7). § 4 and § 5 of the statutes remain unaffected by this. These supplementary credits are not included in the overall grade of the accompanying study programme. At the request of the participant, the supplementary work will be included in the certificate of the accompanying study programme and marked as such. Supplementary coursework is listed with the grades provided for in § 9.

### Module grade calculation

The overall grade of the supplementary course is calculated as a credit-weighted average of the grades that were achieved in the advanced module.

**Annotation**

Climate change, biodiversity crisis, antibiotic resistance, artificial intelligence, carbon capture and storage, and gene editing are just a few areas where science and technology can diagnose and address numerous social and global challenges. The extent to which scientific findings are considered in politics and society depends on various factors, such as public understanding and trust, perceived opportunities and risks, and ethical, social, or legal considerations.

To enable students to use their expertise as future decision-makers in solving social and global challenges, we aim to equip them with the skills to navigate the interfaces between science, business, and politics competently and reflectively. In the Supplementary Studies, they acquire foundational knowledge about the interactions between science, technology, and society.

They learn:

- How reliable scientific knowledge is produced,
- how social expectations and demands influence scientific research, and
- how scientific knowledge is adopted, discussed, and utilized by society.

The program integrates essential insights from psychology, philosophy, economics, social sciences, and cultural studies into these topics. After completing the supplementary studies programme, students can place the content of their specialized studies within a broader social context. This prepares them, as future decision-makers, to navigate competently and reflectively at the intersections between science and various sectors of society, such as politics, business, or journalism, and to contribute effectively to innovation processes, public debates, or political decision-making.

**Workload**

The workload is made up of the number of hours of the individual modules:

- Basic Module approx. 120 hours
- Advanced Module approx. 390 hours
- > Total: approx. 510 hours

In the form of supplementary services, up to approximately 390 hours of work can be added.

**Recommendation**

It is recommended to complete the supplementary study program in three or more semesters, beginning with the lecture series on science, technology, and society in the summer semester. Alternatively, you can start with the basic seminar in the winter semester and then attend the lecture series in the summer semester.

Courses in the Advanced Module can be taken simultaneously. It is also advised to complete courses from each of the three subject areas in the advanced unit.

**Learning type**

- Lectures
- Seminars/Project Seminars
- Workshops

## 6 Courses

### T

### 6.1 Course: Algorithms for Routing [T-INFO-100002]

**Responsible:** TT-Prof. Dr. Thomas Bläsius  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100031 - Algorithms for Routing](#)


**Type**  
Oral examination





**Credits**  
6

**Grading scale**  
Grade to a third

**Recurrence**  
Each summer term

**Version**  
2

Events					
ST 2025	2424638	<a href="#">Algorithmen für Routenplanung (mit Übungen)</a>	3 SWS	Lecture / Practice ( /  )	Feilhauer, Zündorf, Bläsius, Laupichler

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

#### Competence Certificate

oral exam, appr. 20 min.

#### Prerequisites

none

#### Recommendation

none

#### Annotation

none

#### Workload

180 hours

## T

## 6.2 Course: Algorithms I [T-INFO-100001]

**Responsible:** TT-Prof. Dr. Thomas Bläsius  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100030 - Algorithms I](#)

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

Events					
ST 2025	24500	<a href="#">Algorithms I</a>	4 SWS	Lecture / Practice ( / ●	Sanders, Uhl, Seemaier, Lehmann, Hübner, Schimek, Laupichler

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

**Competence Certificate**

written exam, 120 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none



**Workload**





180 hours

## T

**6.3 Course: Analysis and Evolution of Mobility [T-BGU-101004]****Responsible:** PD Dr.-Ing. Martin Kagerbauer**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100583 - Analysis and Evolution of Mobility](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	6	Grade to a third	Each term	1 terms	2

Events					
WT 24/25	6232901	<a href="#">Empirical Data in Transportation</a>	2 SWS	Lecture / Practice ( /  )	Kagerbauer
ST 2025	6232811	<a href="#">Mobility Services and New Forms of Mobility</a>	2 SWS	Lecture / 	Kagerbauer

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

oral exam, appr. 30 min.

**Prerequisites**

The Exercise Transportation Data Analysis (T-BGU-113671) has to be passed.

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-BGU-113671 - Exercise Transportation Data Analysis](#) must have been passed.

**Recommendation**

none

**Annotation**

none

**Workload**

170 hours




## T

## 6.4 Course: Automotive Engineering I [T-MACH-100092]

**Responsible:** Dr.-Ing. Martin Gießler**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-100027 - Automotive Engineering](#)

Type	Credits	Grading scale	Recurrence	Expansion	Language	Version
Written examination	6	Grade to a third	Each winter term	1 terms		3

Events					
WT 24/25	2113805	<a href="#">Automotive Engineering I</a>	4 SWS	Lecture / 	Gießler
WT 24/25	2113809	<a href="#">Automotive Engineering I</a>	4 SWS	Lecture / 	Gießler

Legend:  Online,  Blended (On-Site/Online),  On-Site, x Cancelled**Competence Certificate**

written exam, 120 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

180 hours

**T****6.5 Course: Basic Concepts of Urban Development and Urban Planning [T-ARCH-111657]**

**Responsible:** Prof. Markus Neppl  
**Organisation:** KIT Department of Architecture  
**Part of:** [M-ARCH-100029 - Urban Design in Practice](#)

**Type**  
Oral examination

**Credits**  
2




**Grading scale**  
Grade to a third

**Recurrence**  
Each winter term

**Version**  
1

**Events**

WT 24/25	1731051	<a href="#">Urban Development: Urban Perspectives Basic Concepts of Urban Design and Planning</a>	2 SWS	Lecture / 	Neppl
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Legend:  Online,  Blended (On-Site/Online),  On-Site, x Cancelled

**Competence Certificate**

oral exam, approx. 15 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

60 hours



**T****6.6 Course: Basic Seminar Supplementary Studies on Science, Technology and Society - Self Registration [T-FORUM-113579]**

**Responsible:** Dr. Christine Mielke  
Christine Myglas

**Organisation:**

**Part of:** [M-FORUM-106753 - Supplementary Studies on Science, Technology and Society](#)

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

**Competence Certificate**

Study achievement in the form of a presentation or a term paper or project work in the selected course.

**Prerequisites**

None

**Self service assignment of supplementary studies**

This course can be used for self service assignment of grade acquired from the following study providers:

- Studium Generale. Forum Wissenschaft und Gesellschaft (FORUM) (ehem. ZAK)
- FORUM (ehem. ZAK) Begleitstudium

**Recommendation**

It is recommended that the basic seminar be completed during the same semester as the lecture series "Science in Society". If it is not possible to attend the lecture series and the basic seminar in the same semester, the basic seminar can also be attended in the semesters before the lecture series.

However, attending courses in the advanced unit before attending the basic seminar should be avoided.



**Annotation**





## T

## 6.7 Course: Basics in Computer Vision (2D/3D) [T-BGU-101166]

**Responsible:** Prof. Dr.-Ing. Markus Ulrich**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100674 - 2D/3D Image Analysis and Image Based Tracking Methods](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	3	Grade to a third	Each winter term	1 terms	2

Events					
WT 24/25	6041101	<a href="#">2D Computer Vision</a>	1 SWS	Lecture / 	Ulrich
WT 24/25	6041102	<a href="#">3D Computer Vision</a>	2 SWS	Lecture / 	Jutzi

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

oral exam, appr. 30 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**


90 hours





## T

## 6.8 Course: City Theory [T-ARCH-107377]

**Responsible:** Prof. Dr.-Ing. Barbara Engel  
**Organisation:** KIT Department of Architecture  
**Part of:** [M-ARCH-106310 - Specialization Urban Design](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each winter term	1

Events					
ST 2025	1731172	<a href="#">City Theory/Research Seminar: New Collaborations. Urban Practice of Change.</a>	2 SWS	Seminar / 	Engel, Staab

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

**Competence Certificate**

Other examination requirements each consisting of seminar papers in written and/or drawn form consisting of maximum 20 pages and a presentation or an oral talk lasting maximum 20 minutes.

**Prerequisites**


none




## T

## 6.9 Course: City Transport Facilities [T-BGU-100083]

**Responsible:** Dr.-Ing. Matthias Zimmermann**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100026 - City Transport Facilities](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	4	Grade to a third	Each term	1 terms	2

Events					
WT 24/25	6233909	<a href="#">Inner-city traffic facilities</a>	4 SWS	Lecture / Practice ( /  )	Zimmermann, Mitarbeiter/innen

Legend:  Online,  Blended (On-Site/Online),  On-Site, x Cancelled**Competence Certificate**

oral exam, appr. 45 min.

**Prerequisites**

Exercises and student research project City Transport Facilities has to be passed.

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-BGU-109912 - Exercises and Student Research Project City Transport Facilities](#) must have been passed.

**Recommendation**

none

**Annotation**

none

**Workload**

115 hours

**6.10 Course: Competition in Networks [T-WIWI-100005]**

**Responsible:** Prof. Dr. Kay Mitusch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-100032 - Network Economics](#)

**Type**  
Written examination

**Credits**  
3

**Grading scale**  
Grade to a third

**Recurrence**  
Each winter term

**Version**  
3

Events					
WT 24/25	2561204	<a href="#">Competition in Networks</a>	2 SWS	Lecture /	Mitusch
WT 24/25	2561205	<a href="#">Übung zu Wettbewerb in Netzen</a>	1 SWS	Practice /	Mitusch, Corbo

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

**Competence Certificate**

written exam, 60 min. during the semester break.

Examination is offered every semester and can be retried at any regular examination date.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**




90 hours

## T

**6.11 Course: Digitization in the Railway System [T-MACH-113016]****Responsible:** Prof. Dr.-Ing. Martin Cichon**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-106639 - Mobility- and Vehicle-Systems for Rail and Road Transport](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	4	Grade to a third	Each winter term	1 terms	2

Events					
WT 24/25	2115920	<a href="#">Railway System Digitalisation</a>	2 SWS	Lecture / 	Jost, Cichon

Legend:  Online,  Blended (On-Site/Online),  On-Site, x Cancelled**Competence Certificate**

Oral examination

Duration: approx. 20 minutes

No tools or reference material may be used during the exam.

**Workload**

120 hours

**T****6.12 Course: Elective Specialization Supplementary Studies on Science, Technology and Society / About Knowledge and Science - Self-Registration [T-FORUM-113580]****Responsible:** Dr. Christine Mielke  
Christine Myglas**Organisation:****Part of:** [M-FORUM-106753 - Supplementary Studies on Science, Technology and Society](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

**Competence Certificate**

Another type of examination assessment under § 5, section 3 involves a presentation, term paper, or project work within the chosen course.

**Prerequisites**

None

**Self service assignment of supplementary studies**

This course can be used for self service assignment of grade acquired from the following study providers:

- Studium Generale. Forum Wissenschaft und Gesellschaft (FORUM) (ehem. ZAK)
- FORUM (ehem. ZAK) Begleitstudium

**Recommendation**

The contents of the basic module are helpful. The basic module should be completed or attended in parallel, but not after the advanced module.

The reading recommendations for primary and specialist literature are determined individually by the respective lecturers according to the subject area and course.

**Annotation**

This placeholder can be used for any achievement in the Advanced Unit of the Supplementary Studies.

In the Advanced Module, students can choose their own individual focus, e.g. sustainable development, data literacy, etc. The focus should be discussed with the module coordinator at the FORUM.

**T****6.13 Course: Elective Specialization Supplementary Studies on Science, Technology and Society / Science in Public Debates - Self Registration [T-FORUM-113582]****Responsible:** Dr. Christine Mielke  
Christine Myglas**Organisation:****Part of:** [M-FORUM-106753 - Supplementary Studies on Science, Technology and Society](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

**Competence Certificate**

Another type of examination assessment under § 5, section 3 involves a presentation, term paper, or project work within the chosen course.

**Prerequisites**

None

**Self service assignment of supplementary studies**

This course can be used for self service assignment of grade acquired from the following study providers:

- Studium Generale. Forum Wissenschaft und Gesellschaft (FORUM) (ehem. ZAK)
- FORUM (ehem. ZAK) Begleitstudium

**Recommendation**

The contents of the basic module are helpful. The basic module should be completed or attended in parallel, but not after the advanced module.

The reading recommendations for primary and specialist literature are determined individually by the respective lecturers according to the subject area and course.

**Annotation**

This placeholder can be used for any achievement in the Advanced Unit of the Supplementary Studies.



**T****6.14 Course: Elective Specialization Supplementary Studies on Science, Technology and Society / Science in Society - Self-Registration [T-FORUM-113581]****Responsible:** Dr. Christine Mielke  
Christine Myglas**Organisation:****Part of:** [M-FORUM-106753 - Supplementary Studies on Science, Technology and Society](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

**Competence Certificate**

Another type of examination assessment under § 5, section 3 involves a presentation, term paper, or project work within the chosen course.

**Prerequisites**

None

**Self service assignment of supplementary studies**

This course can be used for self service assignment of grade acquired from the following study providers:

- Studium Generale. Forum Wissenschaft und Gesellschaft (FORUM) (ehem. ZAK)
- FORUM (ehem. ZAK) Begleitstudium

**Recommendation**

The contents of the basic module are helpful. The basic module should be completed or attended in parallel, but not after the advanced module.

The reading recommendations for primary and specialist literature are determined individually by the respective lecturers according to the subject area and course.


**Annotation**




This placeholder can be used for any achievement in the Advanced Unit of the Supplementary Studies.

## T

**6.15 Course: Examination Prerequisite Urban Management [T-BGU-113672]****Responsible:** Prof. Dr. Anke Karmann-Woessner**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100013 - Urban Renewal](#)

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

Events					
WT 24/25	6231801	<a href="#">City Management</a>	2 SWS	Lecture / Practice ( /  )	Karmann-Woessner

Legend:  Online,  Blended (On-Site/Online),  On-Site, x Cancelled**Competence Certificate**presentation, 5-10 min., or seminar paper, 5-10 pages, defined by the selected topic;

Topics and dates are presented at the beginning of the semester.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

30 hours

## T

## 6.16 Course: Exercise Logistics, Supply and Disposal [T-BGU-113017]

**Responsible:** PD Dr.-Ing. Martin Kagerbauer  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [M-BGU-100014 - Space and Infrastructure](#)

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

Events					
ST 2025	6231805	<a href="#">Development, Supply and Disposal Planning</a>	2 SWS	Lecture / Practice ( / )	Kagerbauer

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

**Competence Certificate**

1 plan submission with 1-2 pages written explanation

**Prerequisites**

none

**Recommendation**

none

**Annotation**




none

**Workload**

20 hours

**T****6.17 Course: Exercise Transportation Data Analysis [T-BGU-113671]****Responsible:** PD Dr.-Ing. Martin Kagerbauer**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100583 - Analysis and Evolution of Mobility](#)**Type**  
Completed coursework**Credits**  
0**Grading scale**  
pass/fail**Recurrence**  
Each winter term**Expansion**  
1 terms**Version**  
1

Events					
WT 24/25	6232901	<a href="#">Empirical Data in Transportation</a>	2 SWS	Lecture / Practice ( /  )	Kagerbauer

Legend:  Online,  Blended (On-Site/Online),  On-Site, x Cancelled**Competence Certificate**

Exercise to qualitative and quantitative analyses of travel surveys, appr. 2 pages

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

10 hours





## T

## 6.18 Course: Exercise Transportation Data Analysis [T-BGU-113971]

**Responsible:** Prof. Dr.-Ing. Peter Vortisch**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100015 - Traffic Management and Simulation Methods](#)

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

Events					
ST 2025	6232802	<a href="#">Traffic Management and Telematics</a>	2 SWS	Lecture / Practice ( / )	Vortisch

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

programming exercise with Python

**Prerequisites**

none

**Recommendation**

none

**Annotation**

will be offered newly as examination prerequisite as from summer term 2025

**Workload**

10 hours

## T

**6.19 Course: Exercises and Student Research Project City Transport Facilities [T-BGU-109912]**

**Responsible:** Dr.-Ing. Matthias Zimmermann  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [M-BGU-100026 - City Transport Facilities](#)

**Type**  
Completed coursework

**Credits**  
2


**Grading scale**  
pass/fail





**Recurrence**  
Each winter term

**Expansion**  
1 terms

**Version**  
1

**Events**

WT 24/25	6233909	<a href="#">Inner-city traffic facilities</a>	4 SWS	Lecture / Practice ( /  )	Zimmermann, Mitarbeiter/innen
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Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

report approx. 5 pages and 3 planning documents

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

70 hours

## T


## 6.20 Course: Freight Transport [T-BGU-106611]





**Responsible:** Dr. Eckhard Szimba  
Prof. Dr.-Ing. Peter Vortisch

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

**Part of:** [M-BGU-100020 - Intermodality in Freight, Long-Distance and Air Transport](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	3	Grade to a third	Each term	1 terms	2

Events					
ST 2025	6232809	<a href="#">Freight Transport</a>	2 SWS	Lecture / Practice ( /  )	Szimba

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

### Competence Certificate

written exam, 60 min.

### Prerequisites

none

### Recommendation

none

### Annotation

none

### Workload

90 hours

## T


## 6.21 Course: Fundamentals of Town Planning [T-ARCH-106581]





**Responsible:** Prof. Henri Bava  
Prof. Dr.-Ing. Barbara Engel

**Organisation:** KIT Department of Architecture

**Part of:** [M-ARCH-100029 - Urban Design in Practice](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each summer term	5

Events					
ST 2025	1731151	<a href="#">Basics of Urban Planning: Reading and Designing the City. (Engel)</a>	2 SWS	Lecture / 	Engel

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

**Competence Certificate**

oral exam, appr. 15 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

120 hours



## T

## 6.22 Course: Group Exercise Project Integrated Planning [T-BGU-109916]

**Responsible:** Prof. Dr.-Ing. Peter Vortisch  
Dr.-Ing. Matthias Zimmermann

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

**Part of:** [M-BGU-100018 - Project Integrated Planning](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Completed coursework	5	pass/fail	Each winter term	1 terms	1

Events					
WT 24/25	6230901	<a href="#">Integrated Planning Project</a>	4 SWS	Project (P / ●)	Zimmermann, Vallee

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

**Competence Certificate**

integrated term paper of the whole group and 2 presentations of the result, each appr. 15 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

135 hours

## T



## 6.23 Course: Highway Design [T-BGU-100057]





**Responsible:** Dr.-Ing. Matthias Zimmermann

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

**Part of:** [M-BGU-100017 - Highway Design](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	4	Grade to a third	Each term	1 terms	2

Events					
WT 24/25	6233901	<a href="#">IT-based Road Design</a>	2 SWS	Lecture / Practice ( /  )	Zimmermann
WT 24/25	6233903	<a href="#">Highway Design Project Study</a>	2 SWS	Lecture / Practice ( /  )	Zimmermann

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

### Competence Certificate

oral exam, appr. 30 min.

### Prerequisites

Study project Design of a Rural Road hat to be passed.

### Modeled Conditions

The following conditions have to be fulfilled:

1. The course [T-BGU-109917 - Study Project Design of a Rural Road](#) must have been passed.

### Recommendation

none

### Annotation

none

### Workload




130 hours

## T

**6.24 Course: History of Urban Planning [T-BGU-108441]****Responsible:** Steven Christopher Ross**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100013 - Urban Renewal](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	3	Grade to a third	Each term	1 terms	2

Events					
ST 2025	6328016	<a href="#">Urban Planning I: Urban Planning History</a>	2 SWS	Lecture / 	Ross

Legend:  Online,  Blended (On-Site/Online),  On-Site, x Cancelled**Competence Certificate**

written exam, 90 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none


**Workload**




90 hours

T

**6.25 Course: Image Sequence Analysis [T-BGU-101167]****Responsible:** Prof. Dr.-Ing. Stefan Hinz**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100674 - 2D/3D Image Analysis and Image Based Tracking Methods](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	3	Grade to a third	Each winter term	1 terms	2

Events					
WT 24/25	6043103	<a href="#">Image Sequence Analysis, Lecture</a>	2 SWS	Lecture / 	Meidow

Legend:  Online,  Blended (On-Site/Online),  On-Site, x Cancelled**Competence Certificate**

oral exam, appr. 20 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none





**Workload**

90 hours

**T****6.26 Course: Information Management for Public Mobility Services [T-BGU-106608]****Responsible:** Prof. Dr.-Ing. Peter Vortisch**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-103357 - Special Issues of Public Transport](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	3	Grade to a third	Each winter term	1 terms	1

Events					
WT 24/25	6232905	<a href="#">Information Management for Public Mobility Services</a>	2 SWS	Block / 	Vortisch

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

lecture accompanying exercises, appr. 5 pieces

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

90 hours

## T



## 6.27 Course: Infrastructure Management [T-BGU-106300]





**Responsible:** Dr.-Ing. Matthias Zimmermann

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

**Part of:** [M-BGU-100009 - Infrastructure Management](#)

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

Events					
ST 2025	6233801	<a href="#">Design and Construction of Roads</a>	2 SWS	Lecture / 	Zimmermann, Stelzenmüller
ST 2025	6233802	<a href="#">Operation and Maintenance of Roads</a>	2 SWS	Lecture / 	Zimmermann, Hess, Stelzenmüller

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

### Competence Certificate

written exam, 120 min.

### Prerequisites

none

### Recommendation

none

### Annotation

none



### Workload





180 hours

## T

**6.28 Course: Innovation and Project Management in Rail Vehicle Engineering [T-MACH-113068]****Responsible:** Prof. Dr.-Ing. Martin Cichon**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-106639 - Mobility- and Vehicle-Systems for Rail and Road Transport](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each term	5

Events					
WT 24/25	2115921	<a href="#">Innovation and Project Management in Rail Vehicle Engineering</a>	2 SWS	Lecture / 	Lang, Cichon
ST 2025	2115921	<a href="#">Innovation and Project Management in Rail Vehicle Engineering</a>	2 SWS	Lecture / 	Lang, Cichon

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

Graded examination:

2/3 of the examination: 20-minute oral examination on the content of the lecture

1/3 of the examination performance of another type: unit accompanying the lecture as part of a 10-minute presentation and a practical application from innovation and project management

**Workload**

120 hours

**T****6.29 Course: Interdisciplinary Design – Urban and Transportation Planning [T-BGU-112555]**

**Responsible:** Prof. Dr.-Ing. Barbara Engel  
Prof. Dr.-Ing. Peter Vortisch

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

**Part of:** [M-BGU-106183 - Interdisciplinary Design – Urban and Transportation Planning](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	6	Grade to a third	see Annotations	1 terms	1

**Competence Certificate**

urban planning and traffic planning design services with semester-long supervision:

report with plan illustrations and evaluations from a traffic demand model, approx. 10 pages, and interim and final presentations, each approx. 10 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

The course can only be offered if there is a task suitable for interdisciplinary collaboration in the respective semester. Therefore, the course can only be offered irregularly. Please inform yourself about this also on the website of the Institute of Transportation.

The number of participants in the course is limited to 10 persons. A registration is mandatory. Registration modalities will be published on the institute homepage in due time. If necessary, the places are allocated considering the progress in the students' studies, with priority to students from *Mobility and Infrastructure*. The participation will be confirmed by the end of the first lecture week.

**Workload**

180 hours



## T

## 6.30 Course: International Urban Design [T-ARCH-107376]

**Responsible:** Prof. Dr.-Ing. Barbara Engel  
**Organisation:** KIT Department of Architecture  
**Part of:** [M-ARCH-106310 - Specialization Urban Design](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each summer term	1

Events					
WT 24/25	1731171	<a href="#">International Urban Design: Metropol.X – Santiago de Chile</a>	2 SWS	Seminar / 	Engel, Staab

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


**Competence Certificate**




Other examination requirements each consisting of seminar papers in written and/or drawn form consisting of maximum 20 pages and a presentation or an oral talk lasting maximum 20 minutes.

**Prerequisites**

none

**T****6.31 Course: Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite [T-BGU-103541]****Responsible:** Dr.-Ing. Sven Wursthorn**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100014 - Space and Infrastructure](#)**Type**  
Completed coursework**Credits**  
3**Grading scale**  
pass/fail**Recurrence**  
Each winter term**Expansion**  
1 terms**Version**  
4

Events					
WT 24/25	6071101	<a href="#">Introduction to GIS for Students of Natural Sciences, Engineering and Geosciences, L+E</a>	4 SWS	Lecture / Practice ( /  )	Wursthorn

Legend:  Online,  Blended (On-Site/Online),  On-Site, x Cancelled**Competence Certificate**

The achievement control takes place via accepted exercises.

**Prerequisites**

none

**Recommendation**

none

**Annotation**


none




**Workload**

90 hours

**T****6.32 Course: Introduction to Matlab [T-BGU-106765]****Responsible:** PD Dr.-Ing. Uwe Ehret**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-105163 - Interdisciplinary Qualifications](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Completed coursework	3	pass/fail	Each winter term	1 terms	1

Events					
WT 24/25	6224907	<a href="#">Introduction to Matlab</a>	2 SWS	Lecture / Practice ( /  )	Ehret, Wienhöfer

Legend:  Online,  Blended (On-Site/Online),  On-Site, x Cancelled**Competence Certificate**

Implementation of a Matlab code within a class exercise

**Prerequisites**

none

**Recommendation**

none

**Annotation**

The course is limited to 60 participants. Please register via the student portal (Studierendenportal). Only in case that this should not be possible: Please register via e-mail to the responsible lecturer. Participants are selected according to their progress of study considering the following order: students of Water Science and Engineering, then students of Civil Engineering with focus 'Water and Environment', then other students.

**Workload**

90 hours

## T


**6.33 Course: Introduction to Python [T-BGU-112598]**




**Responsible:** Prof. Dr. Jan Cermak  
Dr. Julia Fuchs

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

**Part of:** [M-BGU-105163 - Interdisciplinary Qualifications](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Completed coursework (practical)	3	pass/fail	Each winter term	1 terms	2

Events					
WT 24/25	6020130	<a href="#">Introduction to Python</a>	2 SWS	Lecture / Practice ( /  )	Fuchs, Bork-Unkelbach

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

**Competence Certificate**

Successfully completed exercises focussing on implementation and documentation of a Python code.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

The associated lecture is especially intended for students of the MSc Geodäsie und Geoinformatik and MSc Remote Sensing and Geoinformatics.

External students may attend the course if there is sufficient capacity. External students communicate their individual interest to participate in this lecture at the latest one week before the start of the lectures via e-mail to [anja.carle@kit.edu](mailto:anja.carle@kit.edu) receive positive/negative feedback regarding the possibility of participation.

The total workload is 90 hours and has to be invested in

- Contact hours: 20 hours
- Self-study: 70 hours
  - consolidation of subject by recapitulation of lectures, by use of references and by own inquiry (40 hours)
  - working on exercises (30 hours)

**Workload**

90 hours

## T




**6.34 Course: Laws and Proceedings Concerning Traffic and Roads [T-BGU-106297]**





**Responsible:** Prof. Dr.-Ing. Peter Vortisch  
Dr.-Ing. Matthias Zimmermann

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

**Part of:** [M-BGU-100011 - Laws and Proceedings Concerning Traffic and Roads](#)

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

Events					
ST 2025	6232801	<a href="#">Assessment and Decision-making Process</a>	1 SWS	Lecture / 	Chlond
ST 2025	6233803	<a href="#">Laws Concerning Traffic and Roads</a>	2 SWS	Lecture / 	Hönig
ST 2025	6233804	<a href="#">Environmental Sustainability of Roads</a>	1 SWS	Lecture / 	Zimmermann

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

**Competence Certificate**

written exam, 120 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

180 hours

**T****6.35 Course: Lecture Series Supplementary Studies on Science, Technology and Society - Self Registration [T-FORUM-113578]**

**Responsible:** Dr. Christine Mielke  
Christine Myglas

**Organisation:**

**Part of:** [M-FORUM-106753 - Supplementary Studies on Science, Technology and Society](#)

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

**Competence Certificate**

Active participation, learning protocols, if applicable.

**Prerequisites**

None

**Self service assignment of supplementary studies**

This course can be used for self service assignment of grade acquired from the following study providers:

- Studium Generale. Forum Wissenschaft und Gesellschaft (FORUM) (ehem. ZAK)
- FORUM (ehem. ZAK) Begleitstudium

**Recommendation**

It is recommended that you complete the lecture series "Science in Society" before attending events in the advanced module and in parallel with attending the basic seminar.

If it is not possible to attend the lecture series and the basic seminar in the same semester, the lecture series can also be attended after attending the basic seminar.

However, attending events in the advanced module before attending the lecture series should be avoided.

**Annotation**


The basic module consists of the lecture series "Science in Society" and the basic seminar. The lecture series is only offered during the summer semester.




The basic seminar can be attended in the summer or winter semester.

T

**6.36 Course: Long-Distance and Air Traffic [T-BGU-106301]****Responsible:** Prof. Dr.-Ing. Peter Vortisch**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100020 - Intermodality in Freight, Long-Distance and Air Transport](#)

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

Events					
WT 24/25	6232904	<a href="#">Long-distance and Air Transportation</a>	2 SWS	Lecture / 	Vortisch, Dozenten

Legend:  Online,  Blended (On-Site/Online),  On-Site, x Cancelled**Competence Certificate**

written exam, 60 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

90 hours

## T

## 6.37 Course: Master's Thesis [T-BGU-110432]

**Responsible:** Studiendekan:in der KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [M-BGU-105164 - Module Master's Thesis](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Final Thesis	30	Grade to a third	Each term	1 terms	1

**Competence Certificate**

duration appr. 6 months

presentation within one month after submission of the thesis

**Prerequisites**

defined for the module Master Thesis

**Final Thesis**

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

**Submission deadline** 6 months**Maximum extension period** 3 months**Correction period** 8 weeks

This thesis requires confirmation by the examination office.

**Recommendation**

see module

**Annotation**

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

**Workload**


900 hours







**T****6.38 Course: Methods, Strategies and Mechanisms of Urban Design [T-ARCH-107411]**

**Responsible:** Prof. Dr.-Ing. Barbara Engel  
**Organisation:** KIT Department of Architecture  
**Part of:** [M-ARCH-106310 - Specialization Urban Design](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each winter term	1

Events					
WT 24/25	1731173	<a href="#">Methods, Strategies and Mechanisms of Urban Design: City in Focus. Interdisciplinary Planning and Designing</a>	2 SWS	Seminar / 	Engel, Neppl, Kannen

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

**Competence Certificate**

Other examination requirements consisting of an oral presentation lasting approx. 20 minutes as well as a written paper on it that encompasses a maximum of 20 pages or a research task or a concept whose type and scope depends on the respective task being assigned.



**Prerequisites**





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## T

**6.39 Course: Models and Methods in Traffic Engineering and Transportation Planning [T-BGU-100012]****Responsible:** Prof. Dr.-Ing. Peter Vortisch**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100008 - Models and Methods in Traffic Engineering and Transportation Planning](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	6	Grade to a third	Each term	1 terms	1

Events					
WT 24/25	6232701	<a href="#">Calculation Methods and Models in Traffic Planning</a>	2 SWS	Lecture / Practice ( /  )	Vortisch, Mitarbeiter/innen
WT 24/25	6232703	<a href="#">Road Traffic Engineering</a>	2 SWS	Lecture / Practice ( /  )	Vortisch, Mitarbeiter/innen

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

oral exam, appr. 20 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**



180 hours





## T

## 6.40 Course: Planning of Transportation Systems [T-BGU-100013]

**Responsible:** Prof. Dr.-Ing. Peter Vortisch**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100016 - Planning of Transportation Systems](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	6	Grade to a third	Each term	1 terms	2

Events					
ST 2025	6232806	<a href="#">Properties of Means of Transport</a>	2 SWS	Lecture / 	Vortisch
ST 2025	6232808	<a href="#">Strategic Traffic Planning</a>	2 SWS	Lecture / 	Waßmuth

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

written exam, 120 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

180 hours

## T

**6.41 Course: Project Integrated Planning [T-BGU-100061]**

**Responsible:** Prof. Dr.-Ing. Peter Vortisch  
Dr.-Ing. Matthias Zimmermann

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

**Part of:** [M-BGU-100018 - Project Integrated Planning](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	1	Grade to a third	Each term	1 terms	2

Events					
WT 24/25	6230901	<a href="#">Integrated Planning Project</a>	4 SWS	Project (P / ●)	Zimmermann, Vallee

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

**Competence Certificate**

oral exam, appr. 30 min.

**Prerequisites**

Group exercise Project Integrated Planning has to be passed.

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-BGU-109916 - Group Exercise Project Integrated Planning](#) must have been passed.

**Recommendation**

none

**Annotation**

none

**Workload**

45 hours





T

**6.42 Course: Quarter Analysis [T-ARCH-107375]**

**Responsible:** Prof. Markus Neppl  
**Organisation:** KIT Department of Architecture  
**Part of:** [M-ARCH-106310 - Specialization Urban Design](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each winter term	1

Events					
WT 24/25	1731095	<a href="#">Quarter Analysis: Urban India - Spatial Structures and Typologies in Metropolitan Areas</a>	2 SWS	Seminar / 	Neppl, Giralt

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

**Competence Certificate**

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

**Prerequisites**


none





## T

## 6.43 Course: Railways in the Transportation Market [T-MACH-105540]

**Responsible:** Prof. Dr.-Ing. Martin Cichon**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-106639 - Mobility- and Vehicle-Systems for Rail and Road Transport](#)

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

Events					
ST 2025	2114914	<a href="#">Railways in the Transportation Market</a>	2 SWS	Block / 	Cichon

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

Oral examination

Duration: ca. 20 minutes

No tools or reference materials may be used during the exam.

**Prerequisites**

none

**Workload**

120 hours

**T****6.44 Course: Registration for Certificate Issuance - Supplementary Studies on  
Science, Technology and Society [T-FORUM-113587]****Responsible:** Dr. Christine Mielke  
Christine Myglas**Organisation:****Part of:** [M-FORUM-106753 - Supplementary Studies on Science, Technology and Society](#)**Type**  
Completed coursework**Credits**  
0**Grading scale**  
pass/fail**Recurrence**  
Each term**Version**  
1**Prerequisites**

In order to register, it is mandatory that the basic module and the advanced module have been completed and that the grades for the partial performances in the advanced module are available.

Registration as a partial achievement means the issue of a certificate.

## T



## 6.45 Course: Road Construction [T-BGU-100058]




**Responsible:** Dr.-Ing. Matthias Zimmermann

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

**Part of:** [M-BGU-100006 - Road Construction](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	6	Grade to a third	Each term	1 terms	1

Events					
WT 24/25	6233904	<a href="#">Laborpraktikum im Straßenwesen</a>	2 SWS	Lecture / Practice ( /  )	Plachkova-Dzhurova
WT 24/25	6233905	<a href="#">Bemessung von Fahrbahnkonstruktionen und Schadensanalytik</a>	2 SWS	Lecture / 	Plachkova-Dzhurova

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

### Competence Certificate

oral exam, appr. 30 min.

### Prerequisites

none

### Recommendation

none

### Annotation

none

### Workload

180 hours







## T

**6.46 Course: Road Safety [T-BGU-100062]****Responsible:** Dr.-Ing. Matthias Zimmermann**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100021 - Road Safety](#)

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

Events					
ST 2025	6233906	<a href="#">Safety Management in Highway Engineering</a>	2 SWS	Lecture / Practice ( /  )	Zimmermann
ST 2025	6233908	<a href="#">Seminar im Straßenwesen</a>	2 SWS	Seminar / 	Zimmermann

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

written exam, 60 min.

**Prerequisites**

Seminar paper Road Safety has to be passed.

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-BGU-109915 - Seminar Paper Road Safety](#) must have been passed.

**Recommendation**

none

**Annotation**

none

**Workload**

90 hours

T

**6.47 Course: Self Assignment HoC-FORUM-SpZ 1 not graded [T-BGU-111641]****Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-105163 - Interdisciplinary Qualifications](#)

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

**Competence Certificate**

according to the assignment to be credited

**Prerequisites**

none

**Self service assignment of supplementary studies**

This course can be used for self service assignment of grade acquired from the following study providers:

- House of Competence
- Sprachenzentrum
- Studium Generale. Forum Wissenschaft und Gesellschaft (FORUM) (ehem. ZAK)

**Recommendation**

none

**Annotation**

'Not assigned grades' can be assigned by the students themselves; titel and CP of the grades are taken over

**Workload**

60 hours

**T****6.48 Course: Self Assignment HoC-FORUM-SpZ 2 not graded [T-BGU-111642]****Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-105163 - Interdisciplinary Qualifications](#)

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

**Competence Certificate**

according to the assignment to be credited

**Prerequisites**

none

**Self service assignment of supplementary studies**

This course can be used for self service assignment of grade acquired from the following study providers:

- House of Competence
- Sprachenzentrum
- Studium Generale. Forum Wissenschaft und Gesellschaft (FORUM) (ehem. ZAK)

**Recommendation**

none

**Annotation**

'Not assigned grades' can be assigned by the students themselves; titel and CP of the grades are taken over

**Workload**

60 hours

T

**6.49 Course: Self Assignment HoC-FORUM-SpZ 3 not graded [T-BGU-111643]****Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-105163 - Interdisciplinary Qualifications](#)

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

**Competence Certificate**

according to the assignment to be credited

**Prerequisites**

none

**Self service assignment of supplementary studies**

This course can be used for self service assignment of grade acquired from the following study providers:

- House of Competence
- Sprachenzentrum
- Studium Generale. Forum Wissenschaft und Gesellschaft (FORUM) (ehem. ZAK)

**Recommendation**

none

**Annotation**

'Not assigned grades' can be assigned by the students themselves; titel and CP of the grades are taken over

**Workload**

60 hours

T

**6.50 Course: Self Assignment HoC-FORUM-SpZ 4 graded [T-BGU-111644]****Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-105163 - Interdisciplinary Qualifications](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	2	Grade to a third	Each term	1 terms	1

**Competence Certificate**

according to the assignment to be credited

**Prerequisites**

none

**Self service assignment of supplementary studies**

This course can be used for self service assignment of grade acquired from the following study providers:

- House of Competence
- Sprachenzentrum
- Studium Generale. Forum Wissenschaft und Gesellschaft (FORUM) (ehem. ZAK)

**Recommendation**

none

**Annotation**

'Not assigned grades' can be assigned by the students themselves; titel and CP of the grades are taken over

**Workload**

60 hours

**T****6.51 Course: Self Assignment HoC-FORUM-SpZ 5 graded [T-BGU-111645]****Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-105163 - Interdisciplinary Qualifications](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	2	Grade to a third	Each term	1 terms	1

**Competence Certificate**

according to the assignment to be credited

**Prerequisites**

none

**Self service assignment of supplementary studies**

This course can be used for self service assignment of grade acquired from the following study providers:

- House of Competence
- Sprachenzentrum
- Studium Generale. Forum Wissenschaft und Gesellschaft (FORUM) (ehem. ZAK)

**Recommendation**

none

**Annotation**

'Not assigned grades' can be assigned by the students themselves; titel and CP of the grades are taken over

**Workload**

60 hours

T

**6.52 Course: Self Assignment HoC-FORUM-SpZ 6 graded [T-BGU-111646]****Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-105163 - Interdisciplinary Qualifications](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	2	Grade to a third	Each term	1 terms	1

**Competence Certificate**

according to the assignment to be credited

**Prerequisites**

none

**Self service assignment of supplementary studies**

This course can be used for self service assignment of grade acquired from the following study providers:

- House of Competence
- Sprachenzentrum
- Studium Generale. Forum Wissenschaft und Gesellschaft (FORUM) (ehem. ZAK)

**Recommendation**

none

**Annotation**

'Not assigned grades' can be assigned by the students themselves; titel and CP of the grades are taken over

**Workload**

60 hours

T

**6.53 Course: Self Assignment HoC-FORUM-SpZ 7 not graded [T-BGU-112840]****Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-105163 - Interdisciplinary Qualifications](#)

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

**Competence Certificate**

according to the assignment to be credited

**Prerequisites**

none

**Self service assignment of supplementary studies**

This course can be used for self service assignment of grade acquired from the following study providers:

- House of Competence
- Sprachenzentrum
- Studium Generale. Forum Wissenschaft und Gesellschaft (FORUM) (ehem. ZAK)

**Recommendation**

none

**Annotation**

'Not assigned grades' can be assigned by the students themselves; titel and CP of the grades are taken over

**Workload**

60 hours



## T



**6.54 Course: Seminar in Transportation [T-BGU-100014]**





**Responsible:** PD Dr.-Ing. Martin Kagerbauer  
Prof. Dr.-Ing. Peter Vortisch

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

**Part of:** [M-BGU-103357 - Special Issues of Public Transport](#)  
[M-BGU-106182 - Seminars on Empirical Research, Modeling and Simulation in Transportation](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	3	Grade to a third	Each term	1 terms	1

Events					
WT 24/25	6232903	<a href="#">Seminar Transport Studies</a>	2 SWS	Seminar / 	Vortisch, Kagerbauer
ST 2025	6232903	<a href="#">Seminar Verkehrswesen</a>	2 SWS	Seminar / 	Vortisch, Kagerbauer

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

**Competence Certificate**

seminar paper, appr. 10 pages, and presentation, appr. 10 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

90 hours


**T****6.55 Course: Seminar on Modeling and Simulation in Transportation [T-BGU-112552]**





**Responsible:** PD Dr.-Ing. Martin Kagerbauer  
Prof. Dr.-Ing. Peter Vortisch

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

**Part of:** [M-BGU-103357 - Special Issues of Public Transport](#)  
[M-BGU-106182 - Seminars on Empirical Research, Modeling and Simulation in Transportation](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	3	Grade to a third	Each winter term	1 terms	1

Events					
WT 24/25	6232907	<a href="#">Seminar Modeling and Simulation in Transportation</a>	2 SWS	Seminar / 	Vortisch, Kagerbauer, Mitarbeiter/innen

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

**Competence Certificate**

work on a practical problem in the area of traffic engineering, traffic simulation or in the area of microscopic travel demand modeling:

final report, appr. 5 pages, and presentation, appr. 10 min.

**Prerequisites**

none

**Recommendation**

modules Models and Methods in Traffic Engineering and Transportation Planning [mobiM201-VERMODELL] or Traffic Management and Simulation Methods [mobiM202-VERMANAGE]

**Annotation**

none


**Workload**





90 hours

**T****6.56 Course: Seminar Paper Road Safety [T-BGU-109915]**

**Responsible:** Dr.-Ing. Matthias Zimmermann  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [M-BGU-100021 - Road Safety](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Completed coursework	3	pass/fail	Each summer term	1 terms	1

Events					
ST 2025	6233908	<a href="#">Seminar im Straßenwesen</a>	2 SWS	Seminar / 	Zimmermann

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

**Competence Certificate**

integrated seminar paper of the team, appr. 10 pages/person and plan documents, presentation appr. 10 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

90 hours

## T

**6.57 Course: Space and Infrastructure [T-BGU-100056]**





**Responsible:** PD Dr.-Ing. Martin Kagerbauer  
Dr.-Ing. Sven Wursthorn

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

**Part of:** [M-BGU-100014 - Space and Infrastructure](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	2	Grade to a third	Each term	1 terms	4

Events					
ST 2025	6231805	<a href="#">Development, Supply and Disposal Planning</a>	2 SWS	Lecture / Practice ( /  )	Kagerbauer

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

**Competence Certificate**

written exam, 90 min.

**Prerequisites**

Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite, as well as Exercise Logistics, Supply and Disposal must be passed.

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-BGU-113017 - Exercise Logistics, Supply and Disposal](#) must have been passed.
2. The course [T-BGU-103541 - Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite](#) must have been passed.

**Recommendation**

none

**Annotation**

none

**Workload**

70 hours

T

**6.58 Course: Special Topics in Highway Engineering [T-BGU-106734]**

**Responsible:** Rainer Hess  
Dr.-Ing. Matthias Zimmermann

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

**Part of:** [M-BGU-100022 - Special Topics in Highway Engineering](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	6	Grade to a third	Each term	1 terms	1

**Competence Certificate**

oral exam, appr. 30 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

180 hours

## T










## 6.59 Course: Special Topics of Urban Design [T-ARCH-107409]





**Responsible:** Prof. Henri Bava  
 Prof. Dr.-Ing. Barbara Engel  
 Prof. Christian Inderbitzin  
 Prof. Markus Neppl

**Organisation:** KIT Department of Architecture

**Part of:** [M-ARCH-106310 - Specialization Urban Design](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each term	1

Events					
WT 24/25	1731095	<a href="#">Quarter Analysis: Urban India - Spatial Structures and Typologies in Metropolitan Areas</a>	2 SWS	Seminar / 	Neppl, Giralt
WT 24/25	1731098	<a href="#">Research Seminar/Special Topics of Urban Design: Urban Digital Twins as a Planning Basis for Solar Potential and Monument Protection</a>	4 SWS	Seminar / 	Neppl, Zeile
WT 24/25	1731171	<a href="#">International Urban Design: Metropol.X – Santiago de Chile</a>	2 SWS	Seminar / 	Engel, Staab
WT 24/25	1731180	<a href="#">Research Seminar: Transformative Planning Culture. Strategies. Plans. Projects.</a>	2 SWS	Seminar / 	Engel
WT 24/25	1731214	<a href="#">Special Topics of Urban Design: Ruralty Facing Climate Change. Lab 3.0 : La Sambre</a>	2 SWS	Seminar / 	Bava, Romero Carnicero
WT 24/25	1731280	<a href="#">Urban Design and Housing: Exhibition Hübsche Pflanzenhäuser</a>	2 SWS	Seminar / 	Inderbitzin, Schork, von Zepelin
ST 2025	1731095	<a href="#">Research Seminar/Special Topics of Urban Design: Climate, energy, cultural heritage + X - Urban digital twins as a simulation tool for urban planning</a>	4 SWS	Seminar / 	Neppl, Zeile
ST 2025	1731272	<a href="#">Exhibition Hübsche Pflanzhäuser</a>	2 SWS	Seminar / 	Inderbitzin, Schork, von Zepelin
ST 2025	1731282	<a href="#">Stadt und Wohnen: Architecture of Living</a>	2 SWS	Seminar / 	Inderbitzin, Schork, von Zepelin

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

**Competence Certificate**


Other examination requirements consisting of seminar papers in written and/or drawing form with a maximum length of 20 pages and a presentation or a paper with a maximum length of 20 minutes.





**Prerequisites**

none

**T****6.60 Course: Study Project Design of a Rural Road [T-BGU-109917]****Responsible:** Dr.-Ing. Matthias Zimmermann**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100017 - Highway Design](#)

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

Events					
WT 24/25	6233903	<a href="#">Highway Design Project Study</a>	2 SWS	Lecture / Practice ( /  )	Zimmermann

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

preparation of 4 planning documents

**Prerequisites**

none

**Recommendation**

none

**Annotation**


none





**Workload**

50 hours

**T****6.61 Course: Sustainability in Mobility Systems [T-BGU-111057]****Responsible:** PD Dr.-Ing. Martin Kagerbauer**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-103357 - Special Issues of Public Transport](#)

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

Events					
WT 24/25	6232906	<a href="#">Sustainability in Mobility Systems</a>	2 SWS	Lecture / 	Kagerbauer, Plötz, Gnann

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

written exam, 60 min., computer-based

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**





90 hours






## T

## 6.62 Course: Technology of Rail Vehicles [T-MACH-100082]

**Responsible:** Prof. Dr.-Ing. Martin Cichon**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-100028 - Technology of Rail Vehicles](#)**Type**  
Written examination**Credits**  
6**Grading scale**  
Grade to a third**Recurrence**  
Each term**Version**  
6

Events					
WT 24/25	2115919	<a href="#">Rail System Technology</a>	2 SWS	Lecture / 	Cichon
WT 24/25	2115996	<a href="#">Rail Vehicle Technology</a>	2 SWS	Lecture / 	Cichon
ST 2025	2115919	<a href="#">Rail System Technology</a>	2 SWS	Lecture / 	Cichon
ST 2025	2115996	<a href="#">Rail Vehicle Technology</a>	2 SWS	Lecture / 	Cichon

Legend:  Online,  Blended (On-Site/Online),  On-Site, x Cancelled**Competence Certificate**

written examination in German language

Duration: 90 minutes

No tools or reference materials may be used during the exam except calculator and dictionary

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none





**Workload**

180 hours

**T****6.63 Course: Tendering, Planning and Financing in Public Transport [T-BGU-101005]****Responsible:** Prof. Dr.-Ing. Peter Vortisch**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-103357 - Special Issues of Public Transport](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	3	Grade to a third	Each term	1 terms	1

Events					
ST 2025	6232807	<a href="#">Competition, Planning and Financing in Public Transport</a>	2 SWS	Lecture / 	Pischon

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

oral exam, appr. 20 min.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**



90 hours





## T

## 6.64 Course: Traffic Management und Simulation Methods [T-BGU-100008]

**Responsible:** Prof. Dr.-Ing. Peter Vortisch**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100015 - Traffic Management and Simulation Methods](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	6	Grade to a third	Each term	1 terms	2

Events					
ST 2025	6232802	<a href="#">Traffic Management and Telematics</a>	2 SWS	Lecture / Practice ( /  )	Vortisch
ST 2025	6232804	<a href="#">Traffic Simulation</a>	2 SWS	Lecture / Practice ( /  )	Vortisch, Mitarbeiter/innen

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

oral exam, appr. 20 min.

**Prerequisites**

Exercise Transportation Data Analysis must be passed

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-BGU-113971 - Exercise Transportation Data Analysis](#) must have been passed.

**Recommendation**

none

**Annotation**

as from summer term 2025 the Exercise Transportation Data Analysis will be implemented as examination prerequisite

**Workload**

180 hours

## T

**6.65 Course: Transport Economics [T-WIWI-100007]**

**Responsible:** Prof. Dr. Kay Mitusch  
Dr. Eckhard Szimba

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-100032 - Network Economics](#)

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

Events					
ST 2025	2560230	<a href="#">Transport Economics</a>	2 SWS	Lecture	Mitusch, Szimba
ST 2025	2560231	<a href="#">Übung zu Transportökonomie</a>	1 SWS	Practice	Krenn

**Competence Certificate**

written exam, 60 min. during the semester break.

Examination is offered every semester and can be retried at any regular examination date.

**Prerequisites**

none

**Recommendation**

none

**Annotation**

none

**Workload**

90 hours

## T



## 6.66 Course: Urban and Regional Planning [T-BGU-100050]




**Responsible:** Dr.-Ing. Tamer Soylu  
Sebastian Wilske

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

**Part of:** [M-BGU-100007 - Urban and Regional Planning](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	6	Grade to a third	Each term	1 terms	1

Events					
WT 24/25	6231701	<a href="#">Urban Planning</a>	2 SWS	Lecture / Practice ( /  )	Soylu
WT 24/25	6231703	<a href="#">Regional Planning</a>	2 SWS	Lecture / 	Wilske

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

### Competence Certificate

oral exam, appr. 30 min.

### Prerequisites

none

### Recommendation

none

### Annotation

none



### Workload




180 hours

## T

**6.67 Course: Urban Management [T-BGU-108442]****Responsible:** Prof. Dr. Anke Karmann-Woessner**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-BGU-100013 - Urban Renewal](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	2	Grade to a third	Each term	1 terms	2

Events					
WT 24/25	6231801	<a href="#">City Management</a>	2 SWS	Lecture / Practice ( /  )	Karmann-Woessner
ST 2025	6231801	<a href="#">City Management</a>	2 SWS	Lecture / Practice ( /  )	Karmann-Woessner

Legend:  Online,  Blended (On-Site/Online),  On-Site, x Cancelled**Competence Certificate**

oral exam, appr. 15 min.

**Prerequisites**

The Examination Prerequisite Urban Management (T-BGU-113672) has to be passed.

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-BGU-113672 - Examination Prerequisite Urban Management](#) must have been passed.

**Recommendation**

none

**Annotation****Please note:**

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

**Workload**


60 hours





## T

## 6.68 Course: Urban Typologies [T-ARCH-107374]

**Responsible:** Prof. Markus Neppl  
**Organisation:** KIT Department of Architecture  
**Part of:** [M-ARCH-106310 - Specialization Urban Design](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each summer term	1

Events					
ST 2025	1731097	<a href="#">Urban Typologies: Architecture Journalism Workshop: We Write About Architecture</a>	4 SWS	Seminar / 	Coenen

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

**Competence Certificate**



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




**Prerequisites**

none

## T

**6.69 Course: Vehicle Systems for Urban Mobility [T-MACH-113069]****Responsible:** Prof. Dr.-Ing. Martin Cichon**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-106639 - Mobility- and Vehicle-Systems for Rail and Road Transport](#)**Type**  
Oral examination**Credits**  
4**Grading scale**  
Grade to a third**Version**  
3

Events					
WT 24/25	2115922	<a href="#">Vehicle Systems for Urban Mobility</a>	2 SWS	Lecture / 	Cichon, Ziesel
ST 2025	2115922	<a href="#">Vehicle Systems for Urban Mobility</a>	2 SWS	Lecture / 	Ziesel, Cichon

Legend:  Online,  Blended (On-Site/Online),  On-Site, x Cancelled**Competence Certificate**

Oral examination

Duration: approx. 20 minutes

No tools or reference material may be used during the exam.

**Workload**

120 hours