

# **Module Manual**

**German – Spanish  
Bachelor-Course  
Civil Engineering**

**Focus: Transportation Engineering  
(8 Semesters)**

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**Basic Studies**  
**Semester 1 + 2**

1 1.1 Module designation (engl.) <b>Mathematics I</b>	1.2 Short designation (optional)		1.3 Module code (aus HIS-POS) <b>BAU.1.0218.0.V.1</b>		
2 2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester				
3 3.1 Offer for the following degree programme(s)  Civil Engineering (BA), Civil Engineering PLUS (BA)  Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	3.2 Compulsory, compulsory elective, elective  Compulsory  Compulsory		3.3 Recommended semester  1st semester  3rd semester		
4 Workload				Total workload	
	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
Contact time	Lecture	2	30	<b>180</b>	<b>6</b>
	Exercise	1	15		
	Seminar based teaching	2	30		
Totals		5	75		
Independent study	Preparation and follow-up				
	Exam preparation		105		
Totals			105		
5 5.1 Qualification goals <b>Professional skills:</b> The students ... <ul style="list-style-type: none"> <li>are able to carry out basic mathematical calculations that are relevant for their future professional life.</li> <li>know the necessary terminology to recognise mathematical problems arising in civil engineering and to apply target-oriented calculation methods.</li> </ul> <b>Methodological skills:</b> The students can... <ul style="list-style-type: none"> <li>apply systematic working and control methods to fundamental mathematical problems</li> <li>interpret results and solutions</li> </ul>					

**Module description**

5 5.3 Module summary What loads can a structure support? How much does a bridge vibrate? If you want to analyse such phenomena, you need mathematics. Here you start with general basics, e.g. Linear Algebra, Vector Calculus and Analytic Geometry.
6 6.1 Prerequisites: Content: Students have a good basic knowledge of mathematics and are confident in elementary calculation techniques. Participation in the "Preliminary Course in Mathematics" is recommended.
6.2 Requirements for the award of credit points Passing the exam
6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes) Written exam (120 min), in exceptional cases oral exam.

	6.4 Requirements for admission to the exam None
	6.5 Assessment pattern in determining the final grade As defined by exam regulations
7	7.1 Course language/s <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	7.2 Coordination Prof. Dr.-Ing. Sandra Carstens
	7.3 Lecturer(s)/Tutor(s): (optional) Prof. Dr.-Ing. Sandra Carstens
	7.4 Maximum number of participants (optional)
	7.5 Supplementary information (optional)

1.1 Module designation (dt./engl.) <b>Mathematics II</b>	1.2 Short designation (optional)		1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0223.0.V.1</b>																																								
2.1 Cycle: Offered <input checked="" type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester																																										
3.1 Offer for the following degree programme(s)  Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	3.2 Compulsory, compulsory elective, elective  Compulsory Compulsory		3.3 Recommended semester  2nd semester 4th semester																																								
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4" data-bbox="81 600 1046 663">4 Workload</th> <th colspan="2" data-bbox="1046 600 1511 663">Total workload</th> </tr> <tr> <th data-bbox="81 663 304 763"></th> <th data-bbox="304 663 684 763">Teaching forms/ Form</th> <th data-bbox="684 663 863 763">Hrs. per form of teaching</th> <th data-bbox="863 663 1046 763">Hrs. per semester per form of teaching/ specified form</th> <th data-bbox="1046 663 1286 763">Workload in hrs.</th> <th data-bbox="1286 663 1511 763">Credit points (Credits)</th> </tr> <tr> <td data-bbox="81 763 304 954" rowspan="3"><b>Contact time</b></td> <td data-bbox="304 763 684 813">Lecture</td> <td data-bbox="684 763 863 813">2</td> <td data-bbox="863 763 1046 813">30</td> <td data-bbox="1046 763 1286 954" rowspan="6" style="text-align: center; vertical-align: middle;"><b>180</b></td> <td data-bbox="1286 763 1511 954" rowspan="6" style="text-align: center; vertical-align: middle;"><b>6</b></td> </tr> <tr> <td data-bbox="304 813 684 862">Exercise</td> <td data-bbox="684 813 863 862">1</td> <td data-bbox="863 813 1046 862">15</td> </tr> <tr> <td data-bbox="304 862 684 911">Seminar based teaching</td> <td data-bbox="684 862 863 911">2</td> <td data-bbox="863 862 1046 911">30</td> </tr> <tr> <td data-bbox="81 911 304 954"><b>Totals</b></td> <td data-bbox="304 911 684 954"></td> <td data-bbox="684 911 863 954"><b>5</b></td> <td data-bbox="863 911 1046 954"><b>75</b></td> </tr> <tr> <td data-bbox="81 954 304 1144" rowspan="3"><b>Independent study</b></td> <td data-bbox="304 954 684 1003">Preparation and follow-up</td> <td data-bbox="684 954 863 1003"></td> <td data-bbox="863 954 1046 1003"></td> </tr> <tr> <td data-bbox="304 1003 684 1052">Exam preparation</td> <td data-bbox="684 1003 863 1052"></td> <td data-bbox="863 1003 1046 1052">105</td> </tr> <tr> <td data-bbox="81 1052 304 1144"><b>Totals</b></td> <td data-bbox="304 1052 684 1144"></td> <td data-bbox="684 1052 863 1144"></td> <td data-bbox="863 1052 1046 1144"><b>105</b></td> </tr> </table>					4 Workload				Total workload			Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)	<b>Contact time</b>	Lecture	2	30	<b>180</b>	<b>6</b>	Exercise	1	15	Seminar based teaching	2	30	<b>Totals</b>		<b>5</b>	<b>75</b>	<b>Independent study</b>	Preparation and follow-up			Exam preparation		105	<b>Totals</b>			<b>105</b>
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	<b>Totals</b>			<b>105</b>																																							
<p>5.1 Qualification goals</p> <p><b>Professional skills:</b> The students can...</p> <ul style="list-style-type: none"> <li>● relate the contents of the module Mathematics I to the newly acquired knowledge in the fields of Differential Calculus, Integral Calculus and Statistics.</li> <li>● perform basic mathematical calculations in the areas of Differential Calculus, Integral Calculus and Statistics.</li> </ul> <p><b>Methodological skills:</b> The students can...</p> <ul style="list-style-type: none"> <li>● apply systematic working and control methods to relevant mathematical problems in Civil Engineering.</li> </ul>																																											
<p>5.2 Content</p> <ul style="list-style-type: none"> <li>● Differential Calculus</li> <li>● Integral Calculus</li> <li>● Statistics</li> </ul>																																											

**Module description**

5.3 Module summary In Mathematics II, the students learn basic mathematical skills for relevant problems in Civil Engineering in Differential Calculus, Integral Calculus and Statistics, expanding the contents of the Mathematics I module.
6.1 Prerequisites: Content: Knowledge of the course content of the module Mathematics I.
6.2 Requirements for the award of credit points Passing the written exam
6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes) Written exam (120 min), in exceptional cases oral exam

	6.4 Requirements for admission to the exam None
	6.5 Assessment pattern in determining the final grade As defined by exam regulations
7	7.1 Course language/s <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	7.2 Coordination Prof. Dr.-Ing. Theda Lücken-Girmscheid
	7.3 Lecturer(s)/Tutor(s): (optional) Prof. Dr.-Ing. Lücken-Girmscheid
	7.4 Maximum number of participants (optional)
	7.5 Supplementary information (optional)



1 1.1 Module designation (dt./engl.) Engineering Mechanics I	1.2 Short designation (optional)		1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0289.0.V.1</b>		
2 2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester				
3 3.1 Offer for the following degree programme(s)  Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	3.2 Compulsory, compulsory elective, elective		3.3 Recommended semester		
	Compulsory		1st semester		
	Compulsory		3rd semester		
4 Workload					
				Total workload	
Contact time	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	<b>180</b>	<b>6</b>
	Lecture	2	30		
	Exercise	1	15		
Seminar based teaching	2	30			
Totals	5	75			
Independent study	Preparation and follow-up				
	Exam preparation		105		
	Totals		105		
5 5.1 Qualification goals					
<b>Professional skills:</b>					
The students are able to...					
<ul style="list-style-type: none"> <li>● explain basic concepts of mechanics as well as physical quantities and units in order to relate them to the general understanding of forces and momentums.</li> <li>● apply graphical and numerical methods for the decomposition and superposition of forces.</li> <li>● recognise static systems and know how to determine static determinacy and displaceable systems.</li> <li>● assess composite static systems for their static determinacy as well as their non-displaceability.</li> <li>● determine internal forces safely and verify them.</li> <li>● apply the equilibrium principle to internal forces in the plane and in space.</li> </ul>					
<b>Methodological skills:</b>					
The students know to...					
<ul style="list-style-type: none"> <li>● apply mathematical skills to technical-physical problems.</li> <li>● apply learned calculation methods to problems arising in Civil Engineering by means of practical exercises.</li> </ul>					
5.2 Content					
<ul style="list-style-type: none"> <li>● Basic concepts of mechanics, physical quantities, units</li> <li>● Central force systems, graphical and numerical methods</li> <li>● General force systems, graphical and numerical methods</li> <li>● Equilibrium, types of support and reactions</li> <li>● Limit cases of equilibrium, positional stability, adhesion and friction</li> <li>● Verification of non-displacement (law of formation, pole plan)</li> <li>● Internal forces</li> <li>● Composite systems</li> <li>● Spatial internal forces</li> </ul>					

**Module description**

5	<b>5.3 Module summary</b> In this module, you will learn the basic equations of statics. It includes topics such as equilibrium of forces, centre of gravity, support reactions, internal forces. You will need this basic knowledge as a basis for structural calculations, among other things.
6	<b>6.1 Prerequisites:</b> Content: The students have a good basic knowledge of Mathematics and Physics and a good three dimensional imagination. <hr/> <b>6.2 Requirements for the award of credit points</b> Passing the exam, and the preliminary exam (term paper). <hr/> <b>6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)</b> Oral and written exam <hr/> <b>6.4 Requirements for admission to the exam</b> Successful completion of the term paper (PVL) <hr/> <b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely: <hr/> <b>7.2 Coordination</b> Prof. Dr.-Ing. Vette <hr/> <b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. Vette, Prof. Dr.-Ing. Waltering, N.N. <hr/> <b>7.4 Maximum number of participants (optional)</b> <hr/> <b>7.5 Supplementary information (optional)</b>

1	1.1 Module designation (dt. /engl.) <b>Engineering Mechanics II</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0291.0.V.1</b>			
2	2.1 Cycle: Offered <input checked="" type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester				
3	3.1 Offer for the following degree programme(s)	3.2 Compulsory, compulsory elective, elective		3.3 Recommended semester		
	Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	Compulsory Compulsory		2nd semester 4th semester		
4	<b>Workload</b>			<b>Total workload</b>		
		Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
	<b>Contact time</b>	Lecture	2	30	<b>180</b>	<b>6</b>
		Exercise	1	15		
		Seminar based teaching	2	30		
	<b>Totals</b>		5	75		
	<b>Independent study</b>	Preparation and follow-up				
	Exam preparation		105			
<b>Totals</b>			105			
5	5.1 Qualification goals					
	<p><b>Professional skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>● use learned calculation methods to make statements about the stress and deformation as well as the failure of components and to evaluate them qualitatively.</li> <li>● draw up simple safety verifications and deformation calculations.</li> <li>● understand stress relationships and apply them to Civil Engineering contexts.</li> <li>● identify important stability cases and validate them against the base cases.</li> </ul> <p><b>Methodological skills:</b> The students know...</p> <ul style="list-style-type: none"> <li>● to apply learned calculation methods to problems arising in Civil Engineering by means of practical exercises.</li> <li>● to apply assessment criteria such as stresses and deformations with regard to the load-bearing capacity of the simplest structural systems.</li> </ul>					
5	5.3 Content					
	<ul style="list-style-type: none"> <li>● Strength theory: Stresses (from two-dimensional internal forces),</li> <li>● material properties (strength, elastic modulus, etc.),</li> <li>● stresses (from spatial internal forces),</li> <li>● Deformations (differential equation of the bending line, principle of work and energy),</li> <li>● Introduction to the calculation with two-dimensional framework programs</li> <li>● Stability problems (buckling of straight bars)</li> </ul>					

**Module description**

5	<b>5.3 Module summary</b> Students will learn the basic equations of Elastostatics. It will be explained how stresses are calculated. They will also learn how to calculate deformations. Together with EM I this knowledge is required, among other things, as a basis for structural calculations.
6	<b>6.1 Prerequisites:</b> Content: The students have a basic knowledge of Engineering Mechanics, a good basic knowledge of Mathematics and Physics, as well as of Building Materials Science.
	<b>6.2 Requirements for the award of credit points</b> Passing the exam and the preliminary exam
	<b>6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)</b> Written and oral exam
	<b>6.4 Requirements for admission to the exam</b> Term paper (PVL)
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	<b>7.2 Coordination</b> Prof. Dr.-Ing. Vette
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. Vette, Prof. Dr.-Ing. Waltering, N.N.
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

1.1 Module designation (dt./engl.) <b>Building Materials Science/Building Chemistry</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0039.0.V</b>			
2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester				
3.1 Offer for the following degree programme(s)  Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	3.2 Compulsory, compulsory elective, elective  Compulsory Compulsory	3.3 Recommended semester  1st semester 3rd semester			
4 Workload					
Teaching forms/ Form			Total workload		
Semester 1	Lecture	2	30	<b>180</b>	<b>6</b>
	Exercise	2	30		
	Practical training	2	30		
Totals		6	90		
Independent study	Preparation and follow-up				
	Exam preparation		90		
Totals			90		
5 5.1 Qualification goals <b>Professional skills:</b> The students are able to... <ul style="list-style-type: none"> <li>name, define and numerically classify the basic parameters for describing the mechanical, physical and chemical properties of building materials,</li> <li>calculate basic parameters on the basis of building material test results,</li> <li>explain the manufacturing process of the presented building materials,</li> <li>establish and explain the relationship between the material composition and the resulting building material behaviour,</li> <li>deduce areas of application and the function of the presented building materials in the buildings based on the typical building material properties,</li> <li>describe the basic damage mechanisms of the presented building materials.</li> </ul> <b>Methodological skills:</b> The students are able to... <ul style="list-style-type: none"> <li>transfer the acquired technical knowledge to practical applications,</li> <li>critically assess the suitability of building materials for different applications,</li> <li>evaluate building materials with regard to basic characteristic properties.</li> </ul> <b>Social skills:</b> The students are able to... <ul style="list-style-type: none"> <li>solve practical construction tasks as part of the practical training in small groups.</li> </ul> <b>Personal skills:</b> The students are able to... <ul style="list-style-type: none"> <li>condense and structure extensive, theoretical specialist information on the basis of learning objectives for solving problems independently.</li> <li>organise the individual module sequence unassisted.</li> </ul>					

5.4	<p><b>Content</b></p> <ul style="list-style-type: none"> <li>• Legal basics on the subject of building materials</li> <li>• Basic building material parameter</li> <li>• Production, structure, technical properties, application and durability of:             <ul style="list-style-type: none"> <li>- Inorganic, mineral building materials</li> <li>- Inorganic, metallic building materials</li> <li>- Organic building materials</li> </ul> </li> <li>• Practical implementation and evaluation of laboratory experiments in small groups on selected topics of Construction Materials Science.</li> </ul>
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**Module description**

5	<p><b>5.3 Module summary</b></p> <p>The functionality of a building depends significantly on the choice of the right building materials. You will learn about the basic building materials and their properties so that you can confidently make the right choice of building material in the future.</p>
6	<p><b>6.1 Prerequisites:</b></p> <p>Content: Basic knowledge in the subjects Mathematics, Physics and Chemistry</p>
	<p><b>6.2 Requirements for the award of credit points</b></p> <p>Passing the module exam (written exam)</p>
	<p><b>6.3 Forms and scope of assessment</b></p> <p>Module exam (written exam)</p>
	<p><b>6.4 Requirements for admission to the exam</b></p> <p>Participation in the practical courses on building materials and passing a preliminary exam in the subject of Building Chemistry.</p>
	<p><b>6.5 Gewichtung der Note bei Ermittlung der Endnote</b></p> <p>As defined by exam regulations</p>
7	<p><b>7.1 Course language/s</b></p> <p><input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:</p>
	<p><b>7.2 Coordination</b></p> <p>Prof. Dr.-Ing. Harnisch</p>
	<p><b>7.3 Lecturer(s)/Tutor(s): (optional)</b></p> <p>Prof. Dr.-Ing. Harnisch</p>
	<p><b>7.4 Maximum number of participants (optional)</b></p>
	<p><b>7.5 Supplementary information (optional)</b></p>

1.1 Module designation (dt./engl.) <b>Building Physics</b>		1.2 Short designation (optional)		1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0066.0.V.1</b>			
2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input checked="" type="checkbox"/> other, namely (summer + winter term)		2.2 Module duration: <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester					
3.1 Offer for the following degree programme(s)		3.2 Compulsory, compulsory elective, elective		3.3 Recommended semester			
Civil Engineering (BA), Civil Engineering PLUS (BA)		Compulsory		1st + 2nd semester			
Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)		Compulsory		3rd + 4th semester			
4 Workload							
Teaching forms/ Form			Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Total workload		
					Workload in hrs.		
					Credit points (Credits)		
Semester 1	Lecture	2	30	<b>180</b>	<b>6</b>		
	Exercise	1	15				
	Practical training	1	15				
Semester 2	Lecture	2	30				
	Exercise	1	15				
	Practical training	1	15				
<b>Totals</b>		<b>8</b>	<b>120</b>				
Independent study	Preparation and follow-up						
	Exam preparation		60				
<b>Totals</b>			<b>60</b>				
5.1 Qualification goals							
<b>Professional skills:</b>							
The students are able to...							
<ul style="list-style-type: none"> <li>to acquire basic knowledge of building physics with regard to terminology, phenomena, calculation methods, regulations and verification procedures.</li> <li>to establish connections between physical and technical criteria in buildings, urban planning and the environment.</li> </ul>							
<b>Methodological skills:</b>							
The students are able to...							
<ul style="list-style-type: none"> <li>dimension building constructions and implement the knowledge of building physics in overall planning concepts.</li> </ul>							
5.5 Content							
<ul style="list-style-type: none"> <li>Thermal insulation: Objectives of thermal insulation, heat transport mechanisms, stationary heat transfer through component surfaces and thermal bridges, heat transfer due to solar radiation, minimum thermal insulation, air tightness and indoor climate, energy-saving thermal insulation, summer thermal insulation, requirements and verification.</li> <li>Moisture protection: Objectives of moisture protection, moisture exposure, technical moisture mechanisms.</li> <li>mechanisms (moisture storage, moisture transport, moisture transfer), condensation inside the building component, condensation on building component surfaces, protection against driving rain and splash water, Requirements and verification.</li> <li>Sound insulation: Physical principles and terminology, building acoustics (airborne sound insulation, impact sound insulation, sound insulation requirements, sound proofs), room acoustics (sound propagation in the room, sound absorption, sound reflection, room acoustic design).</li> <li>Fire protection: fire protection objectives, fire protection concepts, fire progression, preventive constructional fire protection regulations, building classes according to LBO, building material class and fire resistance class, minimum requirements for structural fire protection, fire behaviour of building components.</li> </ul>							

**Module description**

5	<p><b>5.3 Module summary</b> In this module, students learn the basics of heat, moisture, sound and fire protection with regard to the effects on buildings. The relevant regulations of the building code are explained and the corresponding mathematical verifications are carried out.</p>
6	<p><b>6.1 Prerequisites:</b> Content: The students have a basic knowledge of Mathematics and Physics.</p>
	<p><b>6.2 Requirements for the award of credit points</b> Passing the exam, successful participation in exercises and practical training.</p>
	<p><b>6.3 Forms and scope of assessment</b> Module exam, written or oral exam</p>
	<p><b>6.4 Requirements for admission to the exam</b> Successful participation in exercises and practical training.</p>
	<p><b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations</p>
7	<p><b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:</p>
	<p><b>7.2 Coordination</b> Prof. Dr.-Ing. Homann</p>
	<p><b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. Homann, Kim van der Las</p>
	<p><b>7.4 Maximum number of participants (optional)</b></p>
	<p><b>7.5 Supplementary information (optional)</b></p>



1	1.1 Module designation (dt./engl.) <b>Building Construction I</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0046.0.V.1</b>			
2	2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester				
3	3.1 Offer for the following degree programme(s)	3.2 Compulsory, compulsory elective, elective	3.3 Recommended semester			
	Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	Compulsory Compulsory	1st semester 3rd semester			
4	<b>Workload</b>			<b>Total workload</b>		
		Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
	<b>Contact time</b>	Lecture	2	30	<b>150</b>	<b>5</b>
		Practical training	1	15		
		Seminar based teaching	1	15		
	<b>Totals</b>		4	60		
	<b>Independent study</b>	Preparation and follow-up				
	Exam preparation		90			
<b>Totals</b>			90			
5	5.1 Qualification goals					
	<p><b>Professional skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>● assess basic building constructions,</li> <li>● elaborate the details of building constructions,</li> <li>● understand the interaction of individual constructions, taking into account different parameters and boundary influences, as well as the necessary networking with other trades.</li> </ul> <p><b>Methodological skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>● develop individual building constructions and detail points from the expertise acquired in the lecture, taking into account various constraints,</li> <li>● master basic building construction methods,</li> <li>● gain an understanding of the building as a whole and its individual constructions.</li> </ul>					
5.6 Content	<ul style="list-style-type: none"> <li>● Subsoil and foundations, excavation support,</li> <li>● House and site drainage,</li> <li>● Masonry constructions, ceiling systems, building waterproofing, stairs,</li> <li>● Ceiling systems.</li> </ul>					

**Module description**

5	5.3 Module summary Building construction shows how a building is constructed and developed from the foundation to the roof in the most diverse subareas. The module deals with the basic details of the structural design of a building.
6	6.1 Prerequisites: Content: Basic knowledge in the drafting of construction plans.

	6.2 Requirements for the award of credit points Passing the module exam.
	6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes) Submodule exam 1, submodule exam 2, written exams, assignments, open-book elaboration.
	6.4 Requirements for admission to the exam Successful constructive elaborations
	6.5 Assessment pattern in determining the final grade As defined by exam regulations
7	7.1 Course language/s <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	7.2 Coordination Prof. Dr.-Ing. Dietmar Mähner
	7.3 Lecturer(s)/Tutor(s): (optional) Prof. Dr.-Ing. Dietmar Mähner
	7.4 Maximum number of participants (optional)
	7.5 Supplementary information (optional)

1 1.1 Module designation (dt./engl.) <b>Building Construction II</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0051.0.V.1</b>			
2 2.1 Cycle: Offered <input checked="" type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester				
3 3.1 Offer for the following degree programme(s)  Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	3.2 Compulsory, compulsory elective, elective  Compulsory Compulsory	3.3 Recommended semester  2nd semester 4th semester			
4 Workload					
				Total workload	
	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
Contact time	Lecture	2	30	<b>150</b>	<b>5</b>
	Practical training	1	15		
	Seminar based teaching	1	15		
Totals		4	60		
Independent study	Preparation and follow-up				
	Exam preparation		90		
Totals			150		
5 5.1 Qualification goals <b>Professional skills:</b> The students are able to... <ul style="list-style-type: none"> <li>● assess basic building constructions,</li> <li>● constructively design detailed points in building construction,</li> <li>● understand the interaction of individual constructions, taking into account different parameters and boundary influences, as well as the necessary interconnection with other trades.</li> </ul> <b>Methodological skills:</b> The students are able to... <ul style="list-style-type: none"> <li>● develop individual building constructions and detail points from the expertise acquired in the lecture, taking into account various constraints,</li> <li>● master basic building construction methods,</li> <li>● gain an understanding of the overall building and its individual constructions.</li> </ul>					
5.7 Content <ul style="list-style-type: none"> <li>● Methods of visualisation,</li> <li>● structural drafting,</li> <li>● water impermeable structures, balconies, flat roofs, structural bracing, prefabricated construction, dimensional deviations.</li> </ul>					

**Module description**

5	<p>5.3 Module summary</p> <p>Building construction shows how a building is constructed and developed from the foundation to the roof in the most diverse subareas. The module deals with the basic details of the structural design of a building.</p>
6	<p>6.1 Prerequisites:</p> <p>Content: Basic knowledge in the drafting of construction plans.</p>
	<p>6.2 Requirements for the award of credit points</p> <p>Passing the module exam</p>
	<p>6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)</p> <p>Submodule exam 1, submodule exam 2, written exams, assignments, open-book elaboration.</p>
	<p>6.4 Requirements for admission to the exam</p> <p>Successful constructive elaborations</p>
	<p>6.5 Assessment pattern in determining the final grade</p> <p>As defined by exam regulations</p>
7	<p>7.1 Course language/s</p> <p><input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:</p>
	<p>7.2 Coordination</p> <p>Prof. Dr.-Ing. Dietmar Mähner</p>
	<p>7.3 Lecturer(s)/Tutor(s): (optional)</p> <p>Prof. Dr.-Ing. Dietmar Mähner</p>
	<p>7.4 Maximum number of participants (optional)</p>
	<p>7.5 Supplementary information (optional)</p>

1	1.1 Module designation (dt./engl.) <b>Data Processing / CAD</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0111.2.V.1</b>		
2	2.1 Cycle: <input type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input checked="" type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester			
3	3.1 Offer for the following degree programme(s)	3.2 Compulsory, compulsory elective, elective	3.3 Recommended semester		
	Civil Engineering (BA), Civil Engineering PLUS (BA)	Compulsory	1st + 2nd semester		
	Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	Compulsory	3rd + 4th semester		
4	Workload				
			Total workload		
	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
Semester 1	Lecture	2	30	180	6
	Practical training	2	30		
Semester 2	Lecture	2	30		
	Practical training	2	30		
<b>Totals</b>		8	120		
<b>Independent study</b>	Preparation and follow-up				
	Exam preparation		60		
<b>Totals</b>			60		
5	5.1 Qualification goals <u>CAD</u> : Students learn the basics of the drawing programme ACAD. <u>Data Processing</u> : Students learn the basics of a spreadsheet programme, as well as coding simple examples with the programme VBA.  <b>Professional skills:</b> <u>CAD</u> : The students can apply the rules of technical drafting to create and read plans. <u>Data Processing</u> : The students are able to create programme flow charts.  <b>Methodological skills:</b> <u>CAD</u> : The students can design constructions with common computer programs. <u>Data Processing</u> : The students can represent limited problems with the help of programme flow charts.				
	5.8 Content Basics of CAD, concept of the computer programme AutoCAD, drawing, dimensioning, designing with AutoCAD in 2D and 3D.  Formula and functions of the spreadsheet programme EXCEL, macros, programme flow charts according to DIN66001, coding in VBA.				

### Module description

5	5.3 Module summary Basics of computer-aided design* and logical thinking on the basis of PAP'en **
6	6.1 Prerequisites: Content: Basic knowledge of operating a PC
	6.2 Requirements for the award of credit points Passing the exams

	<b>6.3 Forms and scope of assessment</b> Submodule exam, 6.3.1 results from 5.1.1 written exam (drawing tasks on the PC). 6.3.2 results from 5.1.2 written exam.
	<b>6.4 Requirements for admission to the exam</b> Regular and successful participation in the practical training
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	<b>7.2 Coordination</b>
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Dipl.-Ing. Broß
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

\* The language of the engineer is the plan. You learn how to construct building drafts on the computer.

\*\* From the problem to the programme. You learn "logical thinking" with the help of programme flow charts. You code the solution in a computer programme

1	1.1 Module designation (dt. /engl.) <b>Surveying</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0301.0.V.1</b>		
2	2.1 Cycle: Offered <input checked="" type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester			
3	3.1 Offer for the following degree programme(s)  Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	3.2 Compulsory, compulsory elective, elective  Compulsory Compulsory	3.3 Recommended semester  2nd semester 4th semester		
4	Workload				
			Total workload		
	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
Contact time	Lecture	2	30	150	5
	Practical training	2	30		
Totals		4	60		
Independent study	Preparation and follow-up				
	Exam preparation		90		
Totals			90		
5	5.1 Qualification goals <b>Professional skills:</b> The students are able to <ul style="list-style-type: none"> <li>● retrieve and implement the fundamentals of surveying technology,</li> <li>● apply geodetic calculation methods,</li> <li>● make use of surveying instruments,</li> <li>● name types and areas of application of GIS models,</li> <li>● process basic data in a GIS.</li> </ul>				
	5.9 Content <ul style="list-style-type: none"> <li>● Coordinate reference systems and coordinate calculation,</li> <li>● methods of position and height measurement,</li> <li>● coordinate, area and mass calculation,</li> <li>● theory: Fundamentals of geoinformation systems,</li> <li>● application of geographic information systems systems,</li> <li>● practice: Outdoor exercises</li> </ul>				

### Module description

5	5.3 Module summary Surveying is fundamental for the division and description of areas as well as for orientation in space. The module teaches the basics of surveying and provides an introduction to working with geographic information systems.
6	6.1 Prerequisites: None
	6.2 Requirements for the award of credit points Passing the module exam
	6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes) Module exam, (written or oral exam)

	<b>6.4 Requirements for admission to the exam</b> Regular participation and collaboration in the practical exercises
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	<b>7.2 Coordination</b> Prof. Dr.-Ing. Jeanette Klemmer
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. Jeanette Klemmer
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>



## **Focus Studies**

## **Semester 3 + 4**

1	1.1 Module designation (dt./engl.) General Competences - Spanish as a Foreign Language I	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0021.2.V</b> <b>BAU.1.0347.0.P.1</b>			
2	2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester				
3	3.1 Offer for the following degree programme(s)	3.2 Compulsory, compulsory elective, elective	3.3 Recommended semester			
	Civil Engineering (BA), Civil Engineering PLUS (BA)	Compulsory	3rd semester			
	Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	Compulsory	5th semester			
4	Workload		Total workload			
	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)	
	Contact time	Seminar based teaching	1	15		
	Totals		1	15	30	1
	Independent study	Preparation and follow-up				
		Exam preparation		15		
	Totals			15		
5	5.1 Qualification goals <b>Professional, methodological and social skills:</b>  The students can... <ul style="list-style-type: none"> <li>use Spanish in the context of Civil Engineering, both in speaking and writing.</li> </ul>					
5	5.2 Content <ul style="list-style-type: none"> <li>Technical Spanish</li> </ul>					

### Module description

5	5.3 Module summary The submodule "General Competences - Foreign Languages" comprises learning the Spanish language in a professional context in the field of Civil Engineering.
6	6.1 Prerequisites: -
6	6.2 Requirements for the award of credit points Passing the exams
6	6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes) written exam, oral exam or presentation
6	6.4 Requirements for admission to the exam -
6	6.5 Assessment pattern in determining the final grade As defined by exam regulations
7	7.1 Course language/s <input type="checkbox"/> German <input type="checkbox"/> English <input checked="" type="checkbox"/> Other, namely: Spanish

## 7.2 Coordination

Prof. Dr.-Ing. Friedrichsen

## 7.3 Lecturer(s)/Tutor(s): (optional)

Lecturer

## 7.4 Maximum number of participants (optional)

## 7.5 Supplementary information (optional)

The module is a submodule of the module "General Competences".

1	1.1 Module designation (dt./engl.) <b>General Competences - Presentation Techniques</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0023.1.V.1</b>		
2	2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester			
3	3.1 Offer for the following degree programme(s)	3.2 Compulsory, compulsory elective, elective	3.3 Recommended semester		
	Civil Engineering (BA), Civil Engineering PLUS (BA)	Compulsory	3rd semester		
	Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	Compulsory	5th semester		
4	Workload				
				Total workload	
	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
Contact time	Lecture	2	30	<b>60</b>	<b>2</b>
Totals		2	30		
Independent study	Preparation and follow-up				
	Exam preparation		30		
Totals			60		
5	5.1 Qualification goals				
	<p><b>Professional skills:</b> The students can...</p> <ul style="list-style-type: none"> <li>reproduce and adapt the learned basics of presentation techniques and apply them to independently developed professional topics.</li> </ul> <p><b>Methodological skills:</b> The students...</p> <ul style="list-style-type: none"> <li>are able to work out presentation topics independently, to process them scientifically and to compose them in an addressee-oriented way.</li> <li>handle different media for presentation purposes.</li> </ul> <p><b>Personal skills:</b> The students...</p> <ul style="list-style-type: none"> <li>learn to competently present professional topics and to manage time constraints.</li> </ul>				
	5.2 Content				
	<ul style="list-style-type: none"> <li>Presentation preparation (terminology, analysis of the presentation situation, time management, structure, media, ...)</li> <li>Presentation phase (appearance, opening, language, ...)</li> <li>Presentation follow-up (goal, discussion, improvement, ...)</li> </ul>				

**Module description**

5	5.3 Module summary The students acquire basic skills to present content in an appealing and addressee-oriented way. The students develop a presentation in group work, which is presented in a colloquium.
6	6.1 Prerequisites: -

	6.2 Requirements for the award of credit points Submitting a presentation topic on time, passing the presentation.
	6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes) Presentation
	6.4 Requirements for admission to the exam Submitting a presentation topic on time.
	6.5 Assessment pattern in determining the final grade As defined by exam regulations
7	7.1 Course language/s <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	7.2 Coordination Prof. Dr.-Ing. Martin Homann
	7.3 Lecturer(s)/Tutor(s): (optional) Prof. Dr.-Ing. Martin Homann
	7.4 Maximum number of participants (optional)
	7.5 Supplementary information (optional) The module is a submodule of the module „General Competences“

1 1.1 Module designation (dt. /engl.) <b>General competences - Academic Work</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0021.2.V</b>			
2 2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester				
3 3.1 Offer for the following degree programme(s)  Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	3.2 Compulsory, compulsory elective, elective  Compulsory Compulsory	3.3 Recommended semester  3rd semester 5th semester			
4 Workload					
				Total workload	
	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
Contact time	Seminar	1	15	<b>30</b>	<b>1</b>
Totals		1	15		
Independent study	Preparation and follow-up				
	Exam preparation		15		
Totals			15		
5 5.1 Qualification goals <b>Professional skills:</b> The students are able to... <ul style="list-style-type: none"> <li>prepare a scientific paper on a Civil Engineering topic within a predefined scope and structure it logically and in a comprehensibly.</li> </ul> <b>Methodological skills:</b> The students are able to... <ul style="list-style-type: none"> <li>meet the necessary formal requirements of a scientific paper with regard to structure, layout, citation, spelling and style of writing.</li> </ul> <b>Personal skills:</b> The students are able to... <ul style="list-style-type: none"> <li>to independently acquire the theoretical fundamentals on the basis of the material provided, to autonomously choose a topic adjusted to the given scope of the assignment,</li> <li>to reflect on their individual results both within the group as well as in consultation with the lecturer and to adapt them if necessary.</li> </ul> <b>Social skills:</b> The students are able to... <ul style="list-style-type: none"> <li>work in a team, agree on a common topic, divide the task into equally sized work packages and distribute them among the group members,</li> <li>combine the individual work results into a common, consistent elaboration.</li> </ul>					

5.3	<p><b>Content</b></p> <ul style="list-style-type: none"> <li>● Finding a topic,</li> <li>● structuring a scientific paper,</li> <li>● researching and evaluating specialist literature,</li> <li>● citing and providing evidence,</li> <li>● advice on composition and writing,</li> <li>● layout</li> </ul>
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**Module description**

5	<p><b>5.3 Module summary</b></p> <p>This module will prepare you for your final thesis: You will learn how to give your thesis an objective and structure it in a comprehensible way, cite the sources you have used correctly, express yourself scientifically and create an appealing layout.</p>
6	<p><b>6.1 Prerequisites:</b></p> <p>-</p>
	<p><b>6.2 Requirements for the award of credit points</b></p> <p>Working on the online material, attending and participating in classes, passing the term paper.</p>
	<p><b>6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)</b></p> <p>Term paper.</p>
	<p><b>6.4 Requirements for admission to the exam</b></p> <p>Working on the online material, attending and participating in classes.</p>
	<p><b>6.5 Assessment pattern in determining the final grade</b></p> <p>As defined by exam regulations</p>
7	<p><b>7.1 Course language/s</b></p> <p><input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:</p>
	<p><b>7.2 Coordination</b></p> <p>Prof. Dr.-Ing. Friedrichsen</p>
	<p><b>7.3 Lecturer(s)/Tutor(s): (optional)</b></p> <p>Prof. Dr.-Ing. Friedrichsen</p>
	<p><b>7.4 Maximum number of participants (optional)</b></p>
	<p><b>7.5 Supplementary information (optional)</b></p> <p>The module is a submodule of the module "General Competences".</p>

1.1 Module designation (dt./engl.) <b>Geotechnical Engineering</b>	1.2 Short designation (optional)		1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0144.0.V.</b>	
2.1 Cycle: <input type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input checked="" type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester			
3.1 Offer for the following degree programme(s)  Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	3.2 Compulsory, compulsory elective, elective  Compulsory Compulsory		3.3 Recommended semester  3rd + 4th semester 5th + 6th semester	
4 Workload				
Teaching forms/ Form			Total workload	
Semester 1			Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form
Lecture			2	30
Exercise			1	15
Practical training			1	15
Semester 2			2	30
Lecture			1	15
Exercise			1	15
Practical training			1	15
<b>Totals</b>			<b>8</b>	<b>120</b>
<b>Independent study</b>				
Preparation and follow-up				
Exam preparation			60	
<b>Totals</b>			<b>120</b>	
5.1 Qualification goals				
<p><b>Professional skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>● explain the formation, the characteristics and the structure of soil as a building material,</li> <li>● understand soil mechanical relationships,</li> <li>● explain characteristics of the interaction of soil and structure,</li> <li>● calculate the load-bearing capacity and serviceability of foundation structures such as flat and deep foundations, retaining structures, embankments and excavation pits.</li> </ul> <p><b>Methodological skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>● develop and apply solutions and strategies for dimensioning foundation structures according to the subsoil and the special features of the structure, drawing on the expertise acquired in the lecture,</li> <li>● formulate and present the results of the laboratory work in an addressee-oriented manner.</li> </ul>				
5.10 Content				
<ul style="list-style-type: none"> <li>● Formation and investigation of soil and rock, parameters of soil mechanics</li> <li>● Strains and deformations, earth pressure, flat foundations, deep foundations</li> <li>● Supporting structures, embankments, excavations, soil compaction</li> <li>● Compaction tests, water retention, groundwater lowering</li> </ul>				



**Module description**

5	<p><b>5.3 Module summary</b> No building can stand without a foundation. Geotechnical Engineering deals with calculating the foundation and the interaction between the soil and the building. The module covers investigations of the subsoil as well as the computational verifications.</p>
6	<p><b>6.1 Prerequisites:</b> Content: Basic knowledge of Mechanics, Statics, Mathematics and Physics</p> <p><b>6.2 Requirements for the award of credit points</b> Passing the module exam, written exam</p> <p><b>6.3 Forms and scope of assessment</b> Module exam, written exam</p> <p><b>6.4 Requirements for admission to the exam</b> Pre-exam achievements (PVL)</p> <p><b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations</p>
7	<p><b>7.1 Course language/s</b> <input checked="" type="checkbox"/>German <input type="checkbox"/>English <input type="checkbox"/>Other, namely:</p> <p><b>7.2 Coordination</b> Prof. Dr.-Ing. Heimbecher</p> <p><b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. Heimbecher</p> <p><b>7.4 Maximum number of participants (optional)</b></p> <p><b>7.5 Supplementary information (optional)</b></p>

1.1 Module designation (dt./engl.) <b>Fundamentals of Construction Engineering</b>	1.2 Short designation (optional)		1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0160.1.V.1</b>			
2.1 Cycle: <input type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input checked="" type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester					
3.1 Offer for the following degree programme(s)  Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	3.2 Compulsory, compulsory elective, elective  Compulsory Compulsory		3.3 Recommended semester  3rd + 4th semester 5th + 6th semester			
4 Workload						
Teaching forms/ Form			Total workload			
			Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form		
Semester 1	Lecture	2	30	<b>240</b>		
	Exercise	1	15			
Seminar based teaching	1	15	<b>8</b>			
Semester 2	Lecture	2			30	
	Exercise	1			15	
	Seminar based teaching	1			15	
Totals		8			120	
Independent study	Preparation and follow-up					
	Exam preparation			120		
Totals				120		
5.1 Qualification goals						
<b>Professional skills:</b>						
The students are able to...						
<ul style="list-style-type: none"> <li>● determine snow and wind loads,</li> <li>● to draw up basic load-bearing capacity and serviceability checks in solid construction, steel construction and timber construction,</li> <li>● calculate internal forces on simple statically indeterminate systems,</li> <li>● represent and idealise simple real constructions as static systems.</li> </ul>						
<b>Methodological skills:</b>						
The students learn...						
<ul style="list-style-type: none"> <li>● a systematic approach to solving technical problems,</li> <li>● to transfer the acquired approach to other problems in Civil Engineering.</li> </ul>						
5.2 Content						
<ul style="list-style-type: none"> <li>● Load assumptions,</li> <li>● building bracing,</li> <li>● fundamentals of reinforced concrete construction,</li> <li>● load-bearing effect of columns, foundations, slabs and walls,</li> <li>● statically indeterminate systems - continuous beams and frames,</li> <li>● introduction to the application of structural design methods,</li> <li>● fundamentals of steel construction,</li> <li>● fundamentals of timber construction</li> <li>● fundamentals of masonry construction.</li> </ul>						

**Module description**

5	<b>5.3 Module summary</b> The lecture deals with the disciplines of Civil Engineering that are concerned with the fundamentals of the design and dimensioning of structures. Typical applications in solid construction, steel construction and timber construction are presented.
6	<b>6.1 Prerequisites:</b> Content: Knowledge of the contents of Technical Mechanics and Mathematics.
	<b>6.2 Requirements for the award of credit points</b> Passing the written exam
	<b>6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)</b> Submodules 1 and 2, written and oral exam
	<b>6.4 Requirements for admission to the exam</b> Pre-exam achievements (PVL)
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	<b>7.2 Coordination</b> Prof. Dr.-Ing. Kattenstedt
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. Büsse, Prof. Dr.-Ing. Kattenstedt
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

1 1.1 Module designation (dt. /engl.) <b>Fundamentals of Construction Process Engineering</b>	1.2 Short designation (optional)		1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0152.0.V</b>		
2 2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester				
3 3.1 Offer for the following degree programme(s)  Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	3.2 Compulsory, compulsory elective, elective		3.3 Recommended semester		
	Compulsory		3rd semester		
	Compulsory		5th semester		
4 Workload					
				Total workload	
Contact time	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	<b>120</b>	<b>4</b>
	Lecture	2	30		
	Exercise	1	15		
Seminar based teaching	1	15			
Totals		4	60		
Independent study	Preparation and follow-up			<b>120</b>	<b>4</b>
	Exam preparation		60		
Totals			60		
5 5.1 Qualification goals					
<p><b>Professional skills:</b> The students are able to ...</p> <ul style="list-style-type: none"> <li>● apply the contents of the course, to show fields of application as well as advantages and disadvantages of corresponding working procedures of "concrete construction",</li> <li>● explain the working procedures of "concrete construction" as well as their effects on the planning, Preparation and realisation of construction projects,</li> <li>● relate technical knowledge acquired in the lecture to practical examples (e.g. in the context of excursions to construction sites) and to establish correlations,</li> <li>● describe and select technically and economically sensible excavation support incl. dewatering and</li> <li>● explain the different methods for improving the subsoil.</li> </ul> <p><b>Methodological skills:</b> The students are able to ...</p> <ul style="list-style-type: none"> <li>● apply knowledge of concrete construction techniques for the purpose of process comparisons under construction, technical and economic conditions in order to make a target-oriented decision,</li> <li>● plan and design simple building components using formwork principles.</li> </ul>					
5.2 Content					
<ul style="list-style-type: none"> <li>● Excavation support, underpinning,</li> <li>● water retention,</li> <li>● ground improvement,</li> <li>● operational earthworks,</li> <li>● fundamentals of formwork technology (wall and slab formwork),</li> <li>● reinforcement (aspects of construction process technology)</li> <li>● concreting (aspects of construction techniques), concrete curing,</li> <li>● exposed concrete,</li> <li>● double walls / element walls.</li> </ul>					

**Module description**

5	<b>5.3 Module summary</b> The module deals with the procedural basics of structural and Civil Engineering. The focus here is on slab/wall formwork and excavation support. The basic terms and regulations are explained by using examples.
6	<b>6.1 Prerequisites:</b> Useful: construction practice
	<b>6.2 Requirements for the award of credit points</b> Passing the written exam
	<b>6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)</b> Module exam, written exam
	<b>6.4 Requirements for admission to the exam</b> None
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	<b>7.2 Coordination</b> Prof. Dr.-Ing. Biernath
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. Biernath, Prof. Dr.-Ing. Heimbecher
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

1.1 Module designation (dt./engl.) Fundamentals of Water and Resource Management		1.2 Short designation (optional) GrWR		1.3 Modul-Code (aus HIS-POS) BAU.1.0164.1.V			
2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input checked="" type="checkbox"/> other, namely (summer + winter term)		2.2 Module duration: <input type="checkbox"/> <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester					
3.1 Offer for the following degree programme(s)		3.2 Compulsory, compulsory elective, elective		3.3 Recommended semester			
Civil Engineering (BA), Civil Engineering PLUS (BA)		Compulsory		3rd + 4th semester			
Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)				5th + 6th semester			
4 Workload							
				Total workload			
Teaching forms/ Form		Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)		
Semester 1	Lecture	2	30	<b>240</b>	<b>8</b>		
	Exercise	1	15				
	Seminar based teaching	1	15				
Semester 2	Lecture	2	30				
	Exercise	1	15				
	Seminar based teaching	1	15				
<b>Totals</b>			120				
<b>Independent study</b>	Preparation and follow-up						
	Exam preparation		120				
<b>Totals</b>			120				
5.1 Qualification goals							
<p><b>Professional skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>define water and resource management as basic infrastructure for the provision of services of general interest,</li> <li>explain its links with the building industry,</li> <li>develop process engineering and civil engineering solutions,</li> <li>solve simple dimensioning tasks.</li> </ul> <p><b>Methodological skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>develop solutions for simple water and resource management infrastructures,</li> <li>solve simple planning tasks in accordance with the technical regulations.</li> </ul> <p><b>Social skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>train teamwork during the solution of exercises.</li> </ul>							
5.2 Content							
<ul style="list-style-type: none"> <li>Fundamentals of hydromechanics (hydrostatics, floating stability, continuity principle, flow states and dimensionless key figures of flow, energy losses of pipe flow, steady-state uniform channel flow, flow in unconsolidated rocks).</li> <li>Fundamentals of hydraulic engineering (weirs, dams, hydropower plants, ecological improvement of flowing waters)</li> <li>Fundamentals of resource management (waste legislation, waste quantities, construction waste recycling, waste treatment, landfill construction, contaminated sites)</li> <li>Fundamentals of urban drainage (drainage systems, sewerage, construction technology and methods, pipe statics, special structures, pumping stations, stormwater basins, flood protection, stormwater management, site development planning)</li> <li>Fundamentals of wastewater treatment (general planning fundamentals, wastewater constituents, wastewater quantities, mechanical and biological wastewater treatment processes, sewage sludge treatment)</li> </ul>							

**Module description**

5	<b>5.3 Module summary</b> Water and resource management infrastructures and processes have key functions in settled areas. In the module, the basics of these are taught and links to the other specialisations of Civil Engineering are revealed.
6	<b>6.1 Prerequisites:</b> Content: Basic understanding of Civil Engineering, Mathematics I+II
	<b>6.2 Requirements for the award of credit points</b> Passing the written exam; in the submodule exam 2, 20 % of the possible points must additionally be achieved in each of the three written exam parts (Resource Management, Hydromechanics/Hydraulic Engineering and Waste Water Treatment).
	<b>6.3 Forms and scope of assessment</b> Submodule exam 1 and 2, written exam
	<b>6.4 Requirements for admission to the exam</b> None
	<b>6.5 Assessment pattern in determining the final grade</b> Submodule exam 1: 50 %; submodule exam 2: 50 %
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	<b>7.2 Coordination</b> Prof. Dr.-Ing. Uhl (1), Prof. Dr.-Ing. Haberkamp (2)
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. Flamme, Prof. Dr.-Ing. Haberkamp, Prof. Dr.-Ing. Mohn, Prof. Dr.-Ing. Uhl
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

<p>1 1.1 Module designation (dt. /engl.) Fundamentals of Construction Engineering and Construction Law</p>	<p>1.2 Short designation (optional)</p>	<p>1.3 Modul-Code (aus HIS-POS) BAU.1.0151.1.V</p>			
<p>2 2.1 Cycle: Offered <input checked="" type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)</p>	<p>2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester</p>				
<p>3 3.1 Offer for the following degree programme(s) Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)</p>	<p>3.2 Compulsory, compulsory elective, elective Compulsory Compulsory</p>	<p>3.3 Recommended semester 4th semester 6th semester</p>			
<p>4 Workload</p>					
				Total workload	
	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
Contact time	Lecture	3	45	180	6
	Exercise	2	30		
	Seminar based teaching	1	15		
Totals		6	90		
Independent study	Preparation and follow-up				
	Exam preparation		90		
	Totals		90		
<p>5 5.1 Qualification goals</p>					
<p><b>Professional skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>• reflect the specifics of the construction market and the main construction processes,</li> <li>• confidently navigate the construction market and tender and execute construction projects,</li> <li>• provide a cost forecast at any stage of a construction project with the level of detail possible at that time or assess cost forecasts prepared by others,</li> <li>• create schedules for projects and continuously monitor and adjust them over the duration of the project,</li> <li>• tender construction work and calculate tenders for an offer</li> <li>• understand and describe the business processes along the entire value chain in construction,</li> <li>• carry out the essential tasks of work preparation and use a practical example to apply them (e.g. drawing up a project-specific construction site layout plan),</li> <li>• carry out the essential tasks of work Preparation and apply them to a practical example (e.g. preparation of a project-specific construction site layout plan),</li> <li>• understand the action fields of logistics in the construction company and apply them in practice.</li> </ul> <p><b>Social skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>• understand and apply the social skills required in particular for site management,</li> <li>• to work out individual exam performances also as a team in a solution-oriented manner.</li> </ul> <p><b>Personal skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>• manage the time allocated for the exam assignments in such a way that they complete and hand in the assignments on time.</li> </ul>					



5.2	<p><b>Content</b></p> <ul style="list-style-type: none"> <li>• Construction market (participants, special features of the construction market, construction process, project organisation),</li> <li>• cost management (methods of area and cost calculation, planner fees according to (HOAI=German Fee Regulations for Object Planners and Engineers),</li> <li>• scheduling (stages of scheduling, methods and forms of presentation of scheduling,</li> <li>• capacity planning),</li> <li>• quality specifications (tender form, standardisation, functional description),</li> <li>• company processes, calculation of construction services, work preparation, logistics, site management.</li> </ul>
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**Module description**

5	<p><b>5.2 Module summary</b></p> <p>You will learn which specifications (cost budget, schedules, etc.) the client makes and what the construction management has to do (preparation of the individual work steps, setting up the construction site, etc.) so that a construction site runs smoothly. For this, you need certain standards and laws, which you will also be introduced to in this module.</p>
6	<p><b>6.1 Prerequisites:</b></p> <p>-</p>
	<p><b>6.2 Requirements for the award of credit points</b></p> <p>Passing the written exam</p>
	<p><b>6.3 Forms and scope of assessment</b></p> <p>Submodule exam 1: Client-side and contractor-side tasks as written exam (50 % client-side and 50 % contractor-side tasks) Module 2: Construction Law</p>
	<p><b>6.4 Requirements for admission to the exam</b></p> <p>-</p>
	<p><b>6.5 Assessment pattern in determining the final grade</b></p> <p>As defined by exam regulations</p>
7	<p><b>7.1 Course language/s</b></p> <p><input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:</p>
	<p><b>7.2 Coordination</b></p> <p>Prof. Dr.-Ing. Friedrichsen</p>
	<p><b>7.3 Lecturer(s)/Tutor(s): (optional)</b></p> <p>Prof. Dr.-Ing. Friedrichsen, Prof. Dr.-Ing. Paffrath</p>
	<p><b>7.4 Maximum number of participants (optional)</b></p>
	<p><b>7.5 Supplementary information (optional)</b></p> <p>The part " Construction Law" is taught and examined in an independent submodule.</p>

1.1 Module designation (dt. /engl.) <b>Design of Traffic Facilities</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0297.2.V.1</b>			
2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input checked="" type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester				
3.1 Offer for the following degree programme(s)  Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	3.2 Compulsory, compulsory elective, elective  Compulsory Compulsory	3.3 Recommended semester  3rd + 4th semester 5th + 6th semester			
4 Workload					
Teaching forms/ Form			Total workload		
Semester 1		Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.      <b>240</b>	Credit points (Credits)      <b>8</b>
Semester 2					
Totals		7	105		
Independent study		Preparation and follow-up			
Exam preparation			135		
Totals			135		
5.1 Qualification goals <b>Professional skills:</b> The students are able to <ul style="list-style-type: none"> <li>• understand how traffic areas are used by different participants and thus are interrelated,</li> <li>• develop a road design with its elements in ground plan, elevation and cross-section,</li> <li>• apply traffic planning principles, methodology, regulations and guidelines,</li> <li>• identify correlations between transport and the environment,</li> <li>• prepare, carry out and evaluate/process traffic surveys,</li> <li>• calculate and interpret traffic flow parameters,</li> <li>• assess and evaluate road designs qualitatively and develop solution strategies on the basis of a deficiency analysis.</li> </ul> <b>Methodological skills:</b> The students can <ul style="list-style-type: none"> <li>• work scientifically and solve problems,</li> <li>• apply what has been learnt to new tasks.</li> </ul>					
5.2 Content <ul style="list-style-type: none"> <li>• Traffic development and forecast,</li> <li>• driving dynamics,</li> <li>• survey methods in traffic,</li> <li>• planning and conception of traffic facilities for all users,</li> <li>• parameters and analysis of the traffic flow,</li> <li>• efficiency of traffic facilities</li> <li>• accessibility,</li> <li>• traffic and environment,</li> <li>• Urban Development and Regional Planning</li> </ul>					

**Module description**

5	<b>5.3 Module summary</b> Traffic facilities provide the backbone for our mobility. They are largely responsible for the quality and safety of traffic flow. How these facilities are dimensioned, designed and operated is dealt with in detail in this module.
6	<b>6.1 Prerequisites:</b> -
	<b>6.2 Requirements for the award of credit points</b> Passing the written exam
	<b>6.3 Forms and scope of assessment</b> Partial exams, written exams
	<b>6.4 Requirements for admission to the exam</b> Pre-exam achievements (PVL)
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	<b>7.2 Coordination</b> Prof. Dr.-Ing. Jeanette Klemmer
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. Jeanette Klemmer, Prof. Dr.-Ing. Birgit Hartz
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

1	1.1 Module designation (dt. /engl.) <b>Road Construction</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0282.2.V.1</b>				
2	2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input checked="" type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester					
3	3.1 Offer for the following degree programme(s)	3.2 Compulsory, compulsory elective, elective	3.3 Recommended semester				
	Civil Engineering (BA), Civil Engineering PLUS (BA)	Compulsory	3rd + 4th semester				
	Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	Compulsory	5th + 6th semester				
4	Workload			Total workload			
Teaching forms/ Form		Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)		
Semester 1	Lecture	2	30	<b>240</b>	<b>8</b>		
	Exercise	2	30				
Semester 2	Lecture	2	30				
	Exercise	1	30				
Totals		7	105				
Independent study	Preparation and follow-up						
	Exam preparation		135				
Totals			135				
5	<p>5.1 Qualification goals</p> <p><b>Professional skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>• apply the fundamentals of road construction as well as the associated legal regulations and technical codes,</li> <li>• independently dimension the structural design of roads, taking into account complex demands,,</li> <li>• to select the building materials for the construction of traffic routes and to select and optimise their composition,</li> <li>• explain, select and apply suitable construction methods and procedures for the construction and structural maintenance of roads,</li> <li>• understand and apply the essential measures required for quality management in road construction.</li> </ul> <p><b>Methodological skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>• develop and apply problem solving strategies for the dimensioning, construction and maintenance of roads depending on the subsoil, the loads and the special features of the roads, based on the knowledge acquired in the lecture,</li> <li>• transfer what has been learned to new tasks</li> </ul>						

5.2	<p><b>Content</b></p> <ul style="list-style-type: none"> <li>● Introduction to Road Construction,</li> <li>● subsoil and substructure of roads,</li> <li>● dimensioning of the superstructure of traffic areas,</li> <li>● selection and production of construction materials,</li> <li>● use and construction of layers without binders, layers with hydraulic binders and layers of asphalt,</li> <li>● application and execution of construction methods for structural maintenance,</li> <li>● test in road construction (quality control)</li> <li>● structure of a planning contract according to (HOAI=German Fee Regulations for Object Planners and Engineers)</li> </ul>
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**Module description**

5	<p><b>5.3 Module summary</b></p> <p>In the module, calculation and optimisation methods are used to produce and maintain roads of high quality taking into account the interaction of subsoil and demands as well as different construction materials, construction methods and construction processes.</p>
6	<p><b>6.1 Prerequisites:</b></p> <p>Content: Basic knowledge of Mathematics, Building Materials and Geotechnics</p>
	<p><b>6.2 Requirements for the award of credit points</b></p> <p>Passing the module exam</p>
	<p><b>6.3 Forms and scope of assessment</b></p> <p>Partial exams (written or oral exams or project work)</p>
	<p><b>6.4 Requirements for admission to the exam</b></p> <p>Pre-exam achievements (PVL)</p>
	<p><b>6.5 Assessment pattern in determining the final grade</b></p> <p>As defined by exam regulations</p>
7	<p><b>7.1 Course language/s</b></p> <p><input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:</p>
	<p><b>7.2 Coordination</b></p> <p>Prof. Dr.-Ing. Weßelborg</p>
	<p><b>7.3 Lecturer(s)/Tutor(s): (optional)</b></p> <p>Prof. Dr.-Ing. Weßelborg, Dipl.-Ing. Wiemann</p>
	<p><b>7.4 Maximum number of participants (optional)</b></p>
	<p><b>7.5 Supplementary information (optional)</b></p>

1	1.1 Module designation (dt. /engl.) <b>Projects in Transport I</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0251.2.V.1a</b>		
2	2.1 Cycle: Offered <input checked="" type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester			
3	3.1 Offer for the following degree programme(s)	3.2 Compulsory, compulsory elective, elective	3.3 Recommended semester		
	Civil Engineering (BA), Civil Engineering PLUS (BA)	Compulsory	4th semester		
	Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	Compulsory	6th semester		
4	Workload			Total workload	
	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
Semester 1	Practical training	1	10	<b>90</b>	<b>3</b>
	Seminar based teaching	1	15		
<b>Totals</b>		<b>2</b>	<b>25</b>		
<b>Independent study</b>	Preparation and follow-up				
	Exam preparation		85		
<b>Totals</b>			<b>85</b>		
5	5.1 Qualification goals				
	<p><b>Professional skills</b> The students can</p> <ul style="list-style-type: none"> <li>● develop and apply problem-solving strategies based on the expertise acquired in the lecture,</li> <li>● make well-founded, technical engineering decisions.</li> </ul> <p><b>Methodological, social and personal skills</b> The students can</p> <ul style="list-style-type: none"> <li>● discuss problems in a team and show possible solutions, as well as deal with rules and laws in a sound manner,</li> <li>▪ apply acquired interdisciplinary knowledge in a holistic context and communicate solutions,</li> <li>▪ structure and confidently present contents and defend them.</li> </ul>				
5	5.2 Content				
	<ul style="list-style-type: none"> <li>● conduct project-related literature research,</li> <li>● apply rules and regulations,</li> <li>● acquire problem-solving skills,</li> <li>● cooperate,</li> <li>● work scientifically.</li> </ul>				

**Module description**

5	<b>5.3 Module summary</b> In Project Work I, a project is planned, worked on and presented independently in small groups. The topics vary annually and address current issues from the fields of planning, design or road construction.
6	<b>6.1 Prerequisites:</b> -
	<b>6.2 Requirements for the award of credit points</b> Passing the project.
	<b>6.3 Forms and scope of assessment</b> Project work and presentation
	<b>6.4 Requirements for admission to the exam</b> Regular attendance and participation in the course
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	<b>7.2 Coordination</b> Prof. Dr.-Ing. Hartz
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. Hartz, Prof. Dr.-Ing. Klemmer, Prof. Dr.-Ing. Weßelborg
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

1 1.1 Module designation (dt. /engl.) <b>Projects in Transport II</b>		1.2 Short designation (optional)		1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0251.2.V.1a</b>	
2 2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)		2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester			
3 3.1 Offer for the following degree programme(s)		3.2 Compulsory, compulsory elective, elective		3.3 Recommended semester	
Civil Engineering (BA), Civil Engineering PLUS (BA)		Compulsory		5th semester	
Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)		Compulsory		7th semester	
4 Workload					
				Total workload	
Teaching forms/ Form		Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
Semester 1	Practical training	1	15	<b>120</b>	<b>4</b>
	Seminar based teaching	1	20		
<b>Totals</b>		<b>2</b>	<b>35</b>		
<b>Independent study</b>	Preparation and follow-up				
	Exam preparation		85		
<b>Totals</b>			<b>85</b>		
5 5.1 Qualification goals					
<b>Professional skills:</b> The students can					
<ul style="list-style-type: none"> <li>● develop and apply problem solving strategies based on the expertise acquired in the lecture,</li> <li>● independently plan a road construction project involving all disciplines of traffic engineering,</li> <li>● make well-founded engineering decisions.</li> </ul>					
<b>Methodological skills:</b> The students can					
<ul style="list-style-type: none"> <li>▪ develop suitable solutions for specific tasks and compare them with one another,</li> <li>▪ work with current regulations from the transport sector,</li> <li>▪ apply acquired interdisciplinary knowledge in a holistic context and communicate solutions,</li> <li>▪ structure and confidently present contents and defend them.</li> </ul>					
5.3 Content					
Application of the regulations. Independent design and dimensioning of a road with the following contents, among others:					
<ul style="list-style-type: none"> <li>● technical calculation,</li> <li>● technical drawings / plans,</li> <li>● comparison of variants,</li> <li>● cost analysis,</li> <li>● review of the requirements for the structural design,</li> <li>● choice of construction methods,</li> <li>● conception of the asphalt composition,</li> <li>● mass determination</li> </ul>					



**Module description**

5	<b>5.3 Module summary</b> The students create a complete integrated road draft including documentation, technical calculation, plan submission, comparison of variants, cost analysis and mass determination.
6	<b>6.1 Prerequisites:</b> Content: Knowledge from the lectures "Design of traffic systems" and "Road engineering". Useful: Confident handling of trace planning software
	<b>6.2 Requirements for the award of credit points</b> Successful completion of the project
	<b>6.3 Forms and scope of assessment</b> Submission of the project work and oral exam
	<b>6.4 Requirements for admission to the exam</b> Regular attendance and participation in the course
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	<b>7.2 Coordination</b> Prof. Dr.-Ing. Weßelborg
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. Weßelborg, Prof. Dr.-Ing. Hartz, Prof. Dr.-Ing. Klemmer
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

## **Specialised Studies**

### **Semester 5 + 6**

1.1 Module designation (dt./engl.) <b>Railway Construction</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0260.0.V.1a</b>			
2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input checked="" type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester				
3.1 Offer for the following degree programme(s)  Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	3.2 Compulsory, compulsory elective, elective  Compulsory Compulsory	3.3 Recommended semester  5th + 6th semester 7th + 8th semester			
4 Workload					
Teaching forms/ Form			Total workload		
Semester 1		Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.  <b>210</b>	Credit points (Credits)  <b>7</b>
Semester 2					
Totals		5	75		
Independent study		Preparation and follow-up			
Totals			135		
		Exam preparation	90		
5 5.1 Qualification goals <b>Professional skills:</b> The students are able to... <ul style="list-style-type: none"> <li>● explain general principles and understand the terminology of railway engineering,</li> <li>● explain the interrelations between routing, construction and operation,</li> <li>● consider and calculate the driving dynamics,</li> <li>● independently name construction or refurbishment and maintenance measures in rail transport construction and to prepare and carry out planning from a construction management viewpoint,</li> <li>● plan the construction sequence of a rail infrastructure construction site</li> <li>● name construction methods and procedures as well as their advantages and disadvantages and to select them for a specific project.</li> </ul> <b>Methodological skills:</b> The students are able to... <ul style="list-style-type: none"> <li>● cooperate in a team,</li> <li>● analyse and work on problems in a solution-oriented way,</li> <li>● transfer the acquired knowledge to other applications.</li> </ul>					
5.2 Content <ul style="list-style-type: none"> <li>● General principles (terminology, regulations, directives),</li> <li>● railway systems - terminology and modes of operation,</li> <li>● driving dynamics,</li> <li>● fundamentals of the operation of railway systems,</li> <li>● types of superstructure (ballasted track, slab track, tramway superstructure),</li> <li>● planum area (constructions, damages, refurbishments),</li> <li>● superstructure work and superstructure maintenance (minor maintenance, reworking, conversion, ballast cleaning, partial reconstruction, reconstruction, new construction)</li> </ul>					

	<p>use and requirements of large-scale equipment - mechanical track renewal (track renewal train, ballast cleaning, tamping and levelling technology),</p> <ul style="list-style-type: none"> <li>• rail transport structures.</li> </ul>
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**Module description**

5	<p><b>5.3 Module summary</b></p> <p>In the module, we deal with all matters relating to rail transport: From the fundamentals of the railway system and the special features of rail-bound transport to constructive design, the construction process and the use of large-scale equipment.</p>
6	<p><b>6.1 Prerequisites:</b></p> <p>-</p>
	<p><b>6.2 Requirements for the award of credit points</b></p> <p>Passing the module exam</p>
	<p><b>6.3 Forms and scope of assessment</b></p> <p>Module exam (written or oral exam)</p>
	<p><b>6.4 Requirements for admission to the exam</b></p> <p>Pre-exam achievements Admission is granted to those who have successfully completed the module exams of the 1st and 2nd semester</p>
	<p><b>6.5 Assessment pattern in determining the final grade</b></p> <p>As defined by exam regulations</p>
7	<p><b>7.1 Course language/s</b></p> <p><input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:</p>
	<p><b>7.2 Coordination</b></p> <p>Prof. Dr.-Ing. Jeanette Klemmer</p>
	<p><b>7.3 Lecturer(s)/Tutor(s): (optional)</b></p> <p>Tim Westerhaus, M. Sc., Dipl.-Ing. Sascha Frölich</p>
	<p><b>7.4 Maximum number of participants (optional)</b></p>
	<p><b>7.5 Supplementary information (optional)</b></p>

1	1.1 Module designation (dt. /engl.) <b>Special Areas of Road Construction</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0269.1.V.1</b>			
2	2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester				
3	3.1 Offer for the following degree programme(s)	3.2 Compulsory, compulsory elective, elective	3.3 Recommended semester			
	Civil Engineering (BA), Civil Engineering PLUS (BA)	Compulsory	5th semester			
	Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	Compulsory	7th semester			
4	Workload			Total workload		
	Teaching forms/ Form		Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
	Semester 1	Seminar	2	30	<b>120</b>	<b>4</b>
		Exercise	2	30		
	<b>Totals</b>			60		
	<b>Independent study</b>	Preparation and follow-up				
Exam preparation			60			
<b>Totals</b>			120			
5	<p>5.1 Qualification goals</p> <p><b>Professional skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>understand and analyse the variety of special issues in the field of road construction and apply the corresponding technical regulations appropriately to the situation,</li> <li>analyse the condition of a given road structure in the course of a project, develop proposals for the refurbishment of the road and structure it taking into account the constraints of the construction contract,</li> <li>evaluate current innovations in road construction.</li> </ul> <p><b>Methodological skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>apply solution strategies for special problems of road engineering and current innovations based on the expertise acquired in the lecture,</li> <li>formulate and present the corresponding findings and results in an addressee-oriented manner (e.g. citizens, clients, contractors).</li> </ul> <p><b>Social skills</b> The students are able to...</p> <ul style="list-style-type: none"> <li>analyse technical problems of road engineering in a team and solve them cooperatively.</li> </ul>					

5.2	<p><b>Content</b></p> <ul style="list-style-type: none"> <li>● Evaluation of exam and test results,</li> <li>● surface properties of roads (e.g. grip and noise),</li> <li>● conception and production of special construction methods,</li> <li>● presentation of innovative construction methods and techniques (e.g. noise-optimised surface layers),</li> <li>● introduction to systematic road maintenance,</li> <li>● aspects of operational road maintenance,</li> <li>● exemplary selection and application of construction methods for the structural maintenance of traffic route,</li> <li>● discussion of current topics in road construction</li> </ul>
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**Module description**

5	<p><b>5.3 Module summary</b></p> <p>The module deals with exemplary issues and current developments in road construction. The analysis of the road condition, the development of a refurbishment proposal and the tendering of a construction measure are dealt with on the basis of an existing example.</p>
6	<p><b>6.1 Prerequisites:</b></p> <p>Content: Knowledge in the subject of Road Construction</p>
	<p><b>6.2 Requirements for the award of credit points</b></p> <p>Passing the module exam</p>
	<p><b>6.3 Forms and scope of assessment</b></p> <p>Partial exams (written or oral exams)</p>
	<p><b>6.4 Requirements for admission to the exam</b></p> <p>Pre-exam achievements Admission is granted to those who have successfully completed the module exams of the first and second semester.</p>
	<p><b>6.5 Assessment pattern in determining the final grade</b></p> <p>As defined by exam regulations</p>
7	<p><b>7.1 Course language/s</b></p> <p><input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:</p>
	<p><b>7.2 Coordination</b></p> <p>Prof. Dr.-Ing. Weßelborg</p>
	<p><b>7.3 Lecturer(s)/Tutor(s): (optional)</b></p> <p>Prof. Dr.-Ing. Weßelborg, Dipl.-Ing. Scheipers</p>
	<p><b>7.4 Maximum number of participants (optional)</b></p>
	<p><b>7.5 Supplementary information (optional)</b></p>

1 1.1 Module designation (dt. /engl.) Practical Training in Road Construction		1.2 Short designation (optional)		1.3 Modul-Code (aus HIS-POS) BAU.1.0269.1.V.1	
2 2.1 Cycle: Offered jedem <input checked="" type="checkbox"/> SoSe, <input type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)		2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester			
3 3.1 Offer for the following degree programme(s)		3.2 Compulsory, compulsory elective, elective		3.3 Recommended semester	
Civil Engineering (BA), Civil Engineering PLUS (BA)		Compulsory		6th semester	
Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)		Compulsory		8th semester	
4 Workload					
				Total workload	
Teaching forms/ Form		Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
Semester 1	Practical training	1	15	60	2
	Seminar based teaching	1	15		
Totals		2	30		
Independent study	Preparation and follow-up				
	Exam preparation		30		
Totals			60		
5 5.1 Qualification goals					
<b>Professional skills:</b> The students are able to...					
<ul style="list-style-type: none"> <li>test the building materials bitumen and asphalt in compliance with the technical test specifications and standards,</li> <li>evaluate test results related to specific building materials,</li> <li>evaluate test results for specific construction materials in relation to contractual requirements,</li> <li>analyse evaluated test results for specific construction materials in the overall context of asphalt production, asphalt transport, asphalt paving and asphalt compaction.</li> </ul>					
<b>Methodological skills:</b> The students are able to...					
<ul style="list-style-type: none"> <li>analyse special asphalt technology questions based on the expertise acquired in the module and to develop and apply advanced problem-solving strategies for special questions,</li> <li>formulate and present the corresponding findings and results in an addressee-oriented manner (e.g. citizens, clients, contractors).</li> </ul>					
<b>Social skills:</b> The students are able to...					
<ul style="list-style-type: none"> <li>analyse technical road issues in a team and solve them in a cooperative manner.</li> </ul>					
5.3 Content					
<ul style="list-style-type: none"> <li>Introduction to the basic technical regulations, technical test specifications and standards for the laboratory testing of bitumen and asphalt,</li> <li>carrying out bitumen and asphalt tests,</li> <li>evaluation of the test results obtained during the practical training in relation to the degree of contractual fulfilment,</li> <li>processing a fictitious case of damage using the laboratory results obtained,</li> <li>evaluation of exam and test results,</li> <li>elaboration of a test report.</li> </ul>					

**Module description**

5	<b>5.3 Module summary</b> Within the module, students independently carry out test procedures for the exam of bitumen and asphalt, document, evaluate their results, and classify them in the context of technical and contractual aspects of the construction.
6	<b>6.1 Prerequisites:</b> Content: Knowledge in the subjects of Road Engineering and Special Fields of Road Engineering
	<b>6.2 Requirements for the award of credit points</b> Passing the module exam
	<b>6.3 Forms and scope of assessment</b> Partial exam (written elaboration and oral exam)
	<b>6.4 Requirements for admission to the exam</b> Active participation in the laboratory course Admission is granted to those who have successfully completed the module exams of the 1st and 2nd semester
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	<b>7.2 Coordination</b> Prof. Dr.-Ing. Weßelborg
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. Weßelborg, Dr.-Ing. Hülsbömer
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>



1	1.1 Module designation (dt. /engl.) CAD in Road Design	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0106.0.V.2</b>	
2	2.1 Cycle: <input type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input checked="" type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester		
3	3.1 Offer for the following degree programme(s)	3.2 Compulsory, compulsory elective, elective	3.3 Recommended semester	
	Civil Engineering (BA), Civil Engineering PLUS (BA)	Compulsory	5th + 6th semester	
	Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)		7th. + 6th semester	
4	<b>Workload</b>			
				<b>Total workload</b>
	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.      Credit points (Credits)
	Semester 1	Exercise	2	30
		Seminar based teaching	3	45
	Semester 2	Exercise	1	15
		Seminar based teaching	1	15
	<b>Totals</b>		<b>7</b>	<b>105</b>
	<b>Independent study</b>	Preparation and follow-up		
		Exam preparation		105
<b>Totals</b>			<b>105</b>	
5.1 Qualification goals <b>Professional skills:</b> The students are able to... <ul style="list-style-type: none"> <li>design traffic facilities independently using an IT system and then develop planning documents,</li> <li>develop solutions independently and in a project-related way</li> </ul> <b>Methodological skills:</b> The students are able to... <ul style="list-style-type: none"> <li>work constructively together in a team,</li> <li>prepare and present results and share them with third parties</li> </ul>				
5.2 Content <ul style="list-style-type: none"> <li>application of routing software,</li> <li>routing of a road including the design of intersections, cross-section design, massing and preparation of planning documents in accordance with the guidelines.</li> </ul>				
<b>Module description</b>				
5	5.3 Module summary In this module, students learn interactively how to draft with a traffic-specific CAD programme by working on their own project. They learn how to use the software and how to design road traffic facilities in accordance with the regulations.			
6	6.1 Prerequisites: -			
	6.2 Requirements for the award of credit points Passing the module exam			

	<b>6.3 Forms and scope of assessment</b> Module exam (written or oral exam or project exam)
	<b>6.4 Requirements for admission to the exam</b> Pre-exam achievements Admission is granted to those who have successfully completed the module exams of the 1st and 2nd semester.
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	<b>7.2 Coordination</b> Prof. Dr.-Ing. Jeanette Klemmer
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Dipl.-Ing. Hermann Rörick
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

1 1.1 Module designation (dt. /engl.) <b>Applied Mathematics</b>		1.2 Short designation (optional)		1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0025.0.V</b>	
2 2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input checked="" type="checkbox"/> other, namely (summer + winter term)		2.2 Module duration: <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester			
3 3.1 Offer for the following degree programme(s)		3.2 Compulsory, compulsory elective, elective		3.3 Recommended semester	
Civil Engineering (BA), Civil Engineering PLUS (BA)		Compulsory		5th + 6th semester	
Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)		Compulsory		7th + 8th semester	
4 Workload					
				Total workload	
Teaching forms/ Form		Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
Semester 1	Seminar based teaching	1	15	<b>150</b>	<b>5</b>
	Exercise	1	15		
	Seminar based teaching	1	15		
Semester 2	Seminar based teaching	1	15		
<b>Totals</b>		<b>4</b>	<b>60</b>		
Independent study	Preparation and follow-up				
	Exam preparation		90		
<b>Totals</b>			<b>90</b>		
5 5.1 Qualification goals					
<b>Professional skills:</b> The students can					
<ul style="list-style-type: none"> <li>● create and interpret meaningful statistical tables and diagrams,</li> <li>● independently find solutions to simple practical problems with the help of statistical methods.</li> </ul>					
<b>Methodological skills:</b> The students can					
<ul style="list-style-type: none"> <li>● examine data sets with regard to statistical correlations,</li> <li>● work independently with statistical software.</li> </ul>					
5.2 Content					
<ul style="list-style-type: none"> <li>● Descriptive Statistics,</li> <li>● fundamentals of Probability Theory,</li> <li>● random samples,</li> <li>● statistical test procedures,</li> <li>● outlier testing, equalisation calculus,</li> <li>● statistical software.</li> </ul>					

**Module description**

5	<p><b>5.3 Module summary</b> The students become familiar with the application areas of statistics and how to use them to solve traffic problems (e.g. What is the probability that vehicles will back up in front of the railway barrier until they reach the intersection? Are the values collected during a speed measurement normally distributed?) analyse data and evaluate results.</p>
6	<p><b>6.1 Prerequisites:</b> Content: Basic knowledge of Mathematics</p> <hr/> <p><b>6.2 Requirements for the award of credit points</b> Passing the module exam</p> <hr/> <p><b>6.3 Forms and scope of assessment</b> Module exam (written exam (theoretical part + practical work with SPSS) or oral exam or project work)</p> <hr/> <p><b>6.4 Requirements for admission to the exam</b> Pre-exam achievements Admission is granted to those who have successfully completed the module exams of the 1st and 2nd semester.</p> <hr/> <p><b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations</p>
7	<p><b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:</p> <hr/> <p><b>7.2 Coordination</b> Prof. Dr.-Ing. Hartz</p> <hr/> <p><b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. Hartz</p> <hr/> <p><b>7.4 Maximum number of participants (optional)</b></p> <hr/> <p><b>7.5 Supplementary information (optional)</b></p>

<b>1</b> 1.1 Module designation (dt. /engl.) Bridge and Tunnel Construction	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0098.0.V.1 (Bridge)</b> <b>BAU.1.0098.0.V.2 (Tunnel)</b>																																									
<b>2</b> 2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester <input type="checkbox"/>																																										
<b>3</b> 3.1 Offer for the following degree programme(s)  Civil Engineering (BA), Civil Engineering PLUS (BA) Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	3.2 Compulsory, compulsory elective, elective  Compulsory Compulsory	3.3 Recommended semester  5th semester 7th semester																																									
<b>4</b> Workload <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4"></th> <th colspan="2" style="text-align: center;">Total workload</th> </tr> <tr> <th></th> <th style="text-align: center;">Teaching forms/ Form</th> <th style="text-align: center;">Hrs. per form of teaching</th> <th style="text-align: center;">Hrs. per semester per form of teaching/ specified form</th> <th style="text-align: center;">Workload in hrs.</th> <th style="text-align: center;">Credit points (Credits)</th> </tr> </thead> <tbody> <tr> <td rowspan="3" style="text-align: center;"><b>Contact time</b></td> <td>Seminar</td> <td style="text-align: center;">2</td> <td style="text-align: center;">30</td> <td rowspan="6" style="text-align: center; vertical-align: middle;"><b>150</b></td> <td rowspan="6" style="text-align: center; vertical-align: middle;"><b>5</b></td> </tr> <tr> <td>Exercise</td> <td style="text-align: center;">1</td> <td style="text-align: center;">15</td> </tr> <tr> <td>Seminar based teaching</td> <td style="text-align: center;">1</td> <td style="text-align: center;">15</td> </tr> <tr> <td style="text-align: center;"><b>Totals</b></td> <td></td> <td style="text-align: center;">4</td> <td style="text-align: center;">60</td> </tr> <tr> <td rowspan="3" style="text-align: center;"><b>Independent study</b></td> <td>Preparation and follow-up</td> <td></td> <td></td> </tr> <tr> <td>Exam preparation</td> <td></td> <td style="text-align: center;">90</td> </tr> <tr> <td style="text-align: center;"><b>Totals</b></td> <td></td> <td style="text-align: center;">90</td> </tr> </tbody> </table>										Total workload			Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)	<b>Contact time</b>	Seminar	2	30	<b>150</b>	<b>5</b>	Exercise	1	15	Seminar based teaching	1	15	<b>Totals</b>		4	60	<b>Independent study</b>	Preparation and follow-up			Exam preparation		90	<b>Totals</b>		90
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	<b>Totals</b>		90																																								
<b>5</b> 5.1 Qualification goals <b>Professional skills:</b> The students can... <ul style="list-style-type: none"> <li>• describe the load-bearing effect of different bridge structure types and the basic elements of structural maintenance,</li> <li>• calculate load assumptions for road bridges and apply them to different load-bearing systems,</li> <li>• implement the fundamentals of the design of bridge structures taking into account different construction methods,</li> <li>• understand and assess the load-bearing behaviour of tunnel structures,</li> <li>• describe the execution and realisation of tunnel construction projects,</li> <li>• calculate, dimension and construct tunnels.</li> </ul>																																											
5.2 Content <ul style="list-style-type: none"> <li>• Overview of the evolution of bridge construction</li> <li>• load assumptions for road bridges according to DIN EN 1991-2,</li> <li>• explanation of the load-bearing properties of different bridge construction types</li> <li>• bridge components: Bearings, roadway transitions, caps, railings,</li> <li>• substructures of bridges: Abutments, piers,</li> <li>• existing bridges: inspection, maintenance, refurbishment,</li> <li>• overview of the evolution of tunnel construction,</li> <li>• production and construction of tunnels using mining methods,</li> <li>• mechanical tunnelling.</li> </ul>																																											

**Module description**

<b>5.3 Module summary</b> The students learn basic contents and approaches in bridge and tunnel construction to be applied in Structural Engineering and Traffic Engineering.
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6	<p><b>6.1 Prerequisites:</b> Content: Basic knowledge of Geotechnical and Structural Engineering (Statics, Solid Construction and Steel Construction).</p> <p><b>6.2 Requirements for the award of credit points</b> Passing the written exam</p> <p><b>6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)</b> Written exam.</p> <p><b>6.4 Requirements for admission to the exam</b> Admission is granted to those who have successfully completed the module exams of the 1st and 2nd semester.</p> <p><b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations</p>
7	<p><b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:</p> <p><b>7.2 Coordination</b> Prof. Dr.-Ing. D. Mähner</p> <p><b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. D. Mähner (Tunnel Construction), Prof. Dr.-Ing. T. Lücken-Girmscheid (Bridge Construction)</p> <p><b>7.4 Maximum number of participants (optional)</b></p> <p><b>7.5 Supplementary information (optional)</b></p>

<b>1 1.1 Module designation (dt. /engl.)</b> Landscape and Water	<b>1.2 Short designation (optional)</b>		<b>1.3 Modul-Code (aus HIS-POS)</b> <b>BAU.1.0201.0.V.1</b>		
<b>2 2.1 Cycle:</b> Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	<b>2.2 Module duration:</b> <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester				
<b>3 3.1 Offer for the following degree programme(s)</b>	<b>3.2 Compulsory, compulsory elective, elective</b>		<b>3.3 Recommended semester</b>		
Civil Engineering (BA), Civil Engineering PLUS (BA)	Compulsory		5th semester		
Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)	Compulsory		7th semester		
<b>4 Workload</b>					
				<b>Total workload</b>	
	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
<b>Contact time</b>	Lecture	2	30	<b>120</b>	<b>4</b>
	Exercise	1	15		
<b>Totals</b>		3	45		
<b>Independent study</b>	Preparation and follow-up				
	Exam preparation		75		
<b>Totals</b>			75		
<b>5 5.1 Qualification goals</b>					
<b>Professional skills:</b>					
After successful completion, the students will be able to...					
<ul style="list-style-type: none"> <li>● understand the connection between landscape and water bodies and make it the basis of their transport planning work,</li> <li>● evaluate the causes and effects of the natural development of water bodies in different landscape types with regard to hydrodynamic and ecological processes,</li> <li>● apply basic knowledge of concepts, solutions and installations of crossing structures between infrastructure and water bodies as well as the hydromechanical impact on them,</li> <li>● comprehend the complex tasks and problems of designing water bodies and structures in them within an intensively used landscape, as well as in an urban environment, and communicate with specialist planners from landscape design or experts from ecology.</li> </ul>					
<b>Methodological skills:</b>					
After successful completion, the students will be able to...					
<ul style="list-style-type: none"> <li>● select and apply the typical steps and corresponding methods in the planning of intersecting constructions with water bodies,</li> <li>● assess the impact of roads and other modes of transport in the landscape and select measures to avoid and minimise impairments,</li> <li>● have basic knowledge of approaches to solving planning tasks that have far-reaching consequences for the safety of the environment-related protected goods.</li> </ul>					
<b>5.2 Content</b>					
<ul style="list-style-type: none"> <li>● Landscape and land use planning,</li> <li>● legal foundations of water law and water protection, nature conservation and environmental protection,</li> <li>● impact mitigation regulation and landscape conservation planning,</li> <li>● environmental compatibility, flora-fauna-habitat (FFH) compatibility,</li> <li>● water-compatible design of infrastructure/water crossing constructions,</li> <li>● hydrological fundamentals,</li> <li>● basic concepts of the bioengineering stabilisation of embankments along roads and surface waters,</li> <li>● basic principles of ecology and flowing water morphodynamics.</li> </ul>					

**Module description**

5	<b>5.3 Module summary</b> Floods jeopardise bridges, wash-offs from roads endanger water bodies. Demanding planning tasks cannot be mastered with standard solutions. Competences in the specialist areas involved as well as creativity in transport planning are enhanced here.
6	<b>6.1 Prerequisites:</b> Content: successful completion of Fundamentals of Water and Resource Management, 2nd submodule, 4th semester
	<b>6.2 Requirements for the award of credit points</b> Passing the written exam
	<b>6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)</b> Module exam, written or oral exam or project work
	<b>6.4 Requirements for admission to the exam</b> Pre-exam achievements Admission is granted to those who have successfully completed the module exams of the 1st and 2nd semester.
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	<b>7.2 Coordination</b> Prof. Dr.-Ing. R. Mohn
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. R. Mohn, Dipl.-Biol. I. Bünning
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>



1 1.1 Module designation (dt. /engl.) <b>Planning Models / Telematics</b>		1.2 Short designation (optional)		1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0225.0.V.1a</b>	
2 2.1 Cycle: Offered , <input type="checkbox"/> every summer term, , <input type="checkbox"/> every winter term, <input checked="" type="checkbox"/> other, namely (summer + winter term)		2.2 Module duration: <input type="checkbox"/> <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> <input type="checkbox"/> 2 Semester			
3 3.1 Offer for the following degree programme(s)		3.2 Compulsory, compulsory elective, elective		3.3 Recommended semester	
Civil Engineering (BA), Civil Engineering PLUS (BA)		Compulsory		5th + 6th semester	
Civil Engineering dual (BA), Civil Engineering dual PLUS (BA)		Compulsory		7th + 8th semester	
4 Workload					
				Total workload	
Teaching forms/ Form		Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
Semester 1	Seminar	1	15	<b>120</b>	<b>4</b>
	Exercise	1	15		
	Seminar based teaching	1	15		
Semester 2	Seminar	1	15		
<b>Totals</b>		<b>4</b>	<b>60</b>		
<b>Independent study</b>	Preparation and follow-up				
	Exam preparation		60		
<b>Totals</b>			<b>60</b>		
5 5.1 Qualification goals					
<p>The aim of the module part "Planning Models" is the in-depth and practice-oriented knowledge of methods for the conception, calculation, impact assessment and evaluation of traffic systems, traffic route networks and traffic facilities.</p> <p>The module part "Telematics" deals with the possibilities of traffic control.</p> <p><b>Professional skills:</b></p> <p>The students can:</p> <ul style="list-style-type: none"> <li>● apply the methods of the transport planning model and thus determine future burdens of the (newly planned) transport routes,</li> <li>● analyse and assess the effects of planned measures,</li> <li>● describe the construction and use of traffic control systems,</li> <li>● process simple tasks of traffic signal control.</li> </ul> <p><b>Methodological skills:</b></p> <p>The students can:</p> <ul style="list-style-type: none"> <li>● apply the procedures of traffic planning,</li> <li>● develop simple signalling programmes.</li> </ul>					
5.2 Content					
<ul style="list-style-type: none"> <li>● Traffic causes and traffic demand,</li> <li>● traffic calculation models to determine traffic generation, traffic distribution, traffic allocation, traffic reallocation,</li> <li>● traffic effects, traffic noise, pollutants, separation effects, impairment of urban and rural landscape, land use, environmental compatibility,</li> <li>● evaluation of planning results; utility value analysis, benefit-cost studies, evaluation procedures for roads and public transport facilities,</li> <li>● traffic control outside towns / inside towns, fundamentals of signal control and signal programme design,</li> <li>● traffic system management, traffic and parking guidance systems.</li> </ul>					

**Module description**

5	<b>5.3 Module summary</b> The module imparts knowledge about the regularities of the spatio-temporal emergence and implementation of changes in the movements of people (on foot or by means of transport) and goods in the entire public transport area. This enables the calculation of future traffic loads (how much, where, by which means of transport, on which route) of a planned construction measure and the evaluation of its effects. The telematics part focuses on the opportunities for traffic control (traffic management tasks).
6	<b>6.1 Prerequisites:</b> -
	<b>6.2 Requirements for the award of credit points</b> Passing the module exam
	<b>6.3 Forms and scope of assessment</b> Module exam (written or oral exam or project work)
	<b>6.4 Requirements for admission to the exam</b> Pre-exam achievements (PVL) Admission is granted to those who have successfully completed the module exams of the 1st and 2nd semester.
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely
	<b>7.2 Coordination</b> Prof. Dr.-Ing. Hartz
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> Prof. Dr.-Ing. Hartz
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

1	1.1 Module designation (dt. /engl.) <b>Practice Phase</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0230.0.P</b>		
2	2.1 Cycle: Offered <input checked="" type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester			
3	3.1 Offer for the following degree programme(s)	3.2 Compulsory, compulsory elective, elective	3.3 Recommended semester		
	Civil Engineering (BA), Specialised Studies	Compulsory	6th semester		
	Civil Engineering dual (BA), Specialised Studies	Compulsory	8th semester		
4	Workload				
				Total workload	
	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
Contact time	Practical training	2	30	<b>300</b>	<b>10</b>
Totals		2	30		
Independent study	Preparation and follow-up				
	Exam preparation		270		
Totals			270		
5	5.1 Qualification goals				
	<p><b>Professional and methodological skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>transfer the knowledge and skills acquired in various disciplines during their studies to application-oriented activities and more complex problems in practice,</li> <li>work out subject contents using specific problems as examples,</li> <li>understand and adapt the influence of different disciplines on problem solving.</li> </ul> <p><b>Social and personal skills:</b> The students can....</p> <ul style="list-style-type: none"> <li>schedule own activities independently and meet given timelines,</li> <li>develop an independent decision-making ability.</li> </ul>				
	5.2 Content				
	Practical work experience at a national or foreign company/company/authority in the field of specialisation in construction management or traffic engineering with supervision and assumption of engineering tasks including courses accompanying the practical semester, presentation and writing of a report.				

5	5.3 Module summary
	Through a close interlinking of studies and professional practice, the students have the opportunity during the practical phase to explore application-oriented activities and to practise the knowledge and skills they have acquired during their studies.
6	6.1 Prerequisites:
	Formal: Evidence of at least 90 CP
	6.2 Requirements for the award of credit points
	Work reference for the practical phase, submission and presentation of the written report
	6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)
	Submission and presentation of the project report

	6.4 Requirements for admission to the exam Evidence of at least 90 CP
	6.5 Assessment pattern in determining the final grade As defined by exam regulations
7	7.1 Course language/s <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	7.2 Coordination All professors of the Specialisation Studies in Construction Management and Construction Economics as well as Transport Engineering
	7.3 Lecturer(s)/Tutor(s): (optional) All professors of the Specialisation Studies in Construction Management and Construction Economics as well as Transport Engineering
	7.4 Maximum number of participants (optional)
	7.5 Supplementary information (optional)

<p>1 1.1 Module designation (dt. /engl.) Spanish as Foreign Language II</p>	<p>1.2 Short designation (optional)</p>	<p>1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0347.0.P.2</b></p>			
<p>2 2.1 Cycle: Offered, <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)</p>	<p>2.2 Module duration: <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester</p>				
<p>3 3.1 Offer for the following degree programme(s)  Civil Engineering German-Spanish (BA)</p>	<p>3.2 Compulsory, compulsory elective, elective  Compulsory.</p>	<p>3.3 Recommended semester  4th + 6th semester</p>			
<p>4 Workload</p>					
			<p style="text-align: center;">Total workload</p>		
<p>Teaching forms/ Form</p>		<p>Hrs. per form of teaching</p>	<p>Hrs. per semester per form of teaching/ specified form</p>	<p>Workload in hrs.</p>	<p>Credit points (Credits)</p>
<p>Semester 1</p>	<p>Seminar based teaching</p>	<p>1</p>	<p>15</p>	<p style="text-align: center; vertical-align: middle;"><b>120</b></p>	<p style="text-align: center; vertical-align: middle;"><b>4</b></p>
	<p>Exercise</p>	<p>1</p>	<p>15</p>		
<p>Semester 2</p>	<p>Seminar based teaching</p>	<p>2</p>	<p>30</p>		
	<p>Exercise</p>	<p>2</p>	<p>30</p>		
<p>Totals</p>		<p>6</p>	<p>90</p>		
<p>Independent study</p>	<p>Preparation and follow-up</p>				
	<p>Exam preparation</p>		<p>30</p>		
<p>Totals</p>			<p>30</p>		
<p>5 5.1 Qualification goals</p> <p><b>Professional skills:</b></p> <ul style="list-style-type: none"> <li>The students know the essential general and technical vocabulary and have sufficient grammatical knowledge to present technical issues orally and in writing.</li> </ul> <p><b>Methodological skills:</b></p> <ul style="list-style-type: none"> <li>The students are able to express themselves in a technical context at the B1 level, both orally and in writing, in the Spanish language.</li> </ul>					
<p>5.2 Content</p> <ul style="list-style-type: none"> <li>Enhancing language and comprehension skills,</li> <li>conducting simple (technical) dialogues,</li> <li>increasing technical vocabulary,</li> <li>composing coherent technical texts.</li> </ul> <p style="text-align: center;"><b>Module description</b></p>					
<p>6 6.1 Prerequisites: Required: Successful participation in module FSV1 "Spanish as a Foreign Language I / General Competences". or other proof of language competence level A1 to A2  Useful: Knowledge of Spanish from school or other language courses.</p> <p>6.2 Requirements for the award of credit points Passing the module exam</p> <p>6.3 Forms and scope of assessment Module exam, written or oral exam or presentation</p> <p>6.4 Requirements for admission to the exam</p> <p>6.5 Assessment pattern in determining the final grade As defined by exam regulations</p>					

7	7.1 Course language/s <input type="checkbox"/> German <input type="checkbox"/> English <input checked="" type="checkbox"/> Other, namely Spanish
	7.2 Coordination Magister artium M. Lalanne
	7.3 Lecturer(s)/Tutor(s): (optional) Magister artium M. Lalanne
	7.4 Maximum number of participants (optional)
	7.5 Supplementary information (optional)

1	1.1 Module designation (dt. /engl.) <b>Double Degree Project</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0348.0.P</b>		
2	2.1 Cycle: Offered <input checked="" type="checkbox"/> every summer term, <input type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester			
3	3.1 Offer for the following degree programme(s)  Civil Engineering German-Spanish (BA)	3.2 Compulsory, compulsory elective, elective  Compulsory	3.3 Recommended semester  6th semester		
4	Workload				
				Total workload	
	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
	Contact time		12	<b>180</b>	<b>6</b>
	Totals		12		
	Independent study	Independent study	168		
	Totals		168		
5	5.1 Qualification goals <ul style="list-style-type: none"> <li>• Application of known technical knowledge to a given practical engineering problem.</li> <li>• Understanding of the connection between engineering planning and practical construction in terms of a holistic approach.</li> <li>• Proficiency in the independent acquisition of information (literature, standards and company publications),</li> <li>• Proficiency in writing an engineering report.</li> </ul>				
5	5.2 Content <ul style="list-style-type: none"> <li>• Assignment of a practical engineering task,</li> <li>• independent work on the given task.</li> </ul>				

### Module description

5	5.3 Module summary The Double Degree Project comprises the independent elaboration and competent presentation of a practical engineering task. The topics vary annually and address current issues from the fields of planning, design or road construction.
6	6.1 Prerequisites: Evidence of at least 120 CP in the study field Transport Engineering.
	6.2 Voraussetzungen für die Vergabe von Leistungspunkten Successful accomplishment of the project task
	6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes) Submission of the project work and final interview

	<b>6.4 Requirements for admission to the exam</b> The candidate has to report regularly - at least twice - and in person to the supervisor of the project during the processing period on the progress of the project work.
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Other, namely:
	<b>7.2 Coordination</b> All members of the teaching staff of the Department of Civil Engineering
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> All members of the teaching staff of the Department of Civil Engineering
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>



**Supplementary Studies Double Degree**  
**Semester 7 + 8**

<b>1</b> 1.1 Module designation (dt. /engl.) Safety and Legislation	1.2 Short designation (optional)		1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0201.0.V.1</b>		
<b>2</b> 2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester				
<b>3</b> 3.1 Offer for the following degree programme(s)	3.2 Compulsory, compulsory elective, elective		3.3 Recommended semester		
Civil Engineering German-Spanish (BA)	Compulsory		7th semester		
<b>4</b> Workload					
				Total workload	
<b>Contact time</b>	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
	Lecture	4	60		
	Practical studies	1	15		
Exercise	1	15	<b>180</b> <b>6</b>		
<b>Totals</b>		6			
<b>Independent study</b>	Preparation and follow-up				
	Exam preparation		90		
<b>Totals</b>			90		
<b>5</b> 5.1 Qualification goals					
<b>Professional skills:</b> <ul style="list-style-type: none"> <li>● The students should have knowledge of social occupational health and safety, emergency planning and first aid.</li> <li>● The students should be familiar with the basic regulations of the labour contract, administrative and town planning law.</li> <li>● The students should be able to independently assess hazards and initiate appropriate safety measures.</li> </ul> <b>Methodological skills:</b> <ul style="list-style-type: none"> <li>● The students should be able to discuss the fundamental importance of "risk assessment" for Spanish occupational health and safety protection and be able to apply it (implement it) to specific projects,</li> <li>● The students should be able to apply the valid regulations for the prevention of health and safety risks on a case-specific basis.</li> <li>●</li> </ul>					
<b>5.2 Content</b>					
<ul style="list-style-type: none"> <li>● Identification of health and safety risks for each phase of the construction process,</li> <li>● studying of preventive measures to minimise health and safety risks for each phase of the construction process,</li> <li>● dealing with labour and social law in relation to occupational accidents and diseases in the construction industry,</li> <li>● introduction to administrative law,</li> <li>● study of the various modalities of contracting by public authorities and knowledge of administrative resources,</li> <li>● study of the procedure of compulsory expropriation,</li> <li>● basic regulations for geotechnical engineering, hydraulic engineering and road construction.</li> </ul>					

**Module description**

5	<b>5.3 Module summary</b> Fatal and serious accidents at work must be avoided at all costs in construction. The module teaches the fundamentals of liability law and efficient prevention concepts for safe construction operations.
6	<b>6.1 Prerequisites:</b> Required: good knowledge of the fundamentals of construction operations
	<b>6.2 Requirements for the award of credit points</b> Successful completion of the practicals, group work and passing the written exam
	<b>6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)</b> Written exam (70%), practical training (10%), individual and group work (20%) or overall written exam (100%)
	<b>6.4 Requirements for admission to the exam</b> Pre-exam achievements (PVL)
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input type="checkbox"/> German <input type="checkbox"/> English <input checked="" type="checkbox"/> Other, namely: Spanish
	<b>7.2 Coordination</b> s. lecturers' overview UPV/EHU
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> s. lecturers' overview UPV/EHU
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

<b>1</b> 1.1 Module designation (dt. /engl.) Traffic Planning, Operation and Logistics	<b>1.2</b> Short designation (optional)	<b>1.3</b> Modul-Code (aus HIS-POS) <b>BAU.1.0201.0.V.1</b>			
<b>2</b> 2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	<b>2.2</b> Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester				
<b>3</b> 3.1 Offer for the following degree programme(s)	<b>3.2</b> Compulsory, compulsory elective, elective	<b>3.3</b> Recommended semester			
Civil Engineering German-Spanish (BA)	Compulsory	7th semester			
<b>4</b> Workload					
				<b>Total workload</b>	
<b>Contact time</b>	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
	Lecture	4	60		
	Practical training	1	15		
Exercise	1	15	<b>180</b> <b>6</b>		
<b>Totals</b>		6			
<b>Independent study</b>	Preparation and follow-up			<b>180</b> <b>6</b>	
	Exam preparation		90		
<b>Totals</b>			90		
<b>5</b> 5.1 Qualification goals					
<b>Professional skills:</b> <ul style="list-style-type: none"> <li>● The students have knowledge about the design and operation of transport infrastructures.</li> <li>● The students are familiar with basic transport concepts and know the importance of transport for society and daily life.</li> </ul> <b>Methodological skills:</b> <ul style="list-style-type: none"> <li>● The students can identify and analyse characteristic properties of transport systems.</li> <li>● The students are able to analyse the service classes and capacities of the different road types.</li> </ul>					
<b>5.3</b> Content					
<ul style="list-style-type: none"> <li>● Introduction to the basic characteristics of road systems,</li> <li>● characteristics of road bound traffic flows</li> <li>● analysis of road bound traffic flows,</li> <li>● capacities and usage levels of conventional roads,</li> <li>● capacities and usage levels of road types such as motorways, motorways and other roads with separated lanes,</li> <li>● capacities and usage levels of intersections with priority signals and traffic lights,</li> <li>● capacities and usage levels of transport junctions such as highway entrances, exits and intersections</li> </ul>					

**Module description**

5	<b>5.3 Module summary</b> Transport infrastructures provide the basis for our mobility. They are primarily responsible for the quality and safety of the traffic flow. This module examines in detail the interaction between the planning process, operation and logistics.
6	<b>6.1 Prerequisites:</b> Required: good knowledge of fundamentals of road engineering
	<b>6.2 Requirements for the award of credit points</b> Passing the written exam
	<b>6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)</b> Written exam (100 %)
	<b>6.4 Requirements for admission to the exam</b> Pre-exam achievements (PVL)
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input type="checkbox"/> German <input type="checkbox"/> English <input checked="" type="checkbox"/> Other, namely: Spanish
	<b>7.2 Coordination</b> s. lecturers' overview UPV/EHU
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> s. lecturers' overview UPV/EHU
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

<b>1</b> 1.1 Module designation (dt. /engl.) Methods of Transport Network Planning	<b>1.2 Short designation (optional)</b>		<b>1.3 Modul-Code</b> (aus HIS-POS) <b>BAU.1.0201.0.V.1</b>																																							
<b>2</b> 2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	<b>2.2 Module duration:</b> <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester																																									
<b>3</b> 3.1 Offer for the following degree programme(s)  Civil Engineering German-Spanish (BA)	<b>3.2 Compulsory, compulsory elective, elective</b>  Compulsory		<b>3.3 Recommended semester</b>  7th semester																																							
<b>4 Workload</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4"></th> <th colspan="2" style="text-align: center;">Total workload</th> </tr> <tr> <th></th> <th>Teaching forms/ Form</th> <th>Hrs. per form of teaching</th> <th>Hrs. per semester per form of teaching/ specified form</th> <th>Workload in hrs.</th> <th>Credit points (Credits)</th> </tr> </thead> <tbody> <tr> <td rowspan="3" style="text-align: center;"><b>Contact time</b></td> <td>Lecture</td> <td style="text-align: center;">4</td> <td style="text-align: center;">60</td> <td rowspan="6" style="text-align: center; vertical-align: middle;"><b>180</b></td> <td rowspan="6" style="text-align: center; vertical-align: middle;"><b>6</b></td> </tr> <tr> <td>Practical training</td> <td style="text-align: center;">1</td> <td style="text-align: center;">15</td> </tr> <tr> <td>Exercise</td> <td style="text-align: center;">1</td> <td style="text-align: center;">15</td> </tr> <tr> <td style="text-align: center;"><b>Totals</b></td> <td></td> <td style="text-align: center;">4</td> <td style="text-align: center;">90</td> </tr> <tr> <td rowspan="3" style="text-align: center;"><b>Independent study</b></td> <td>Preparation and follow-up</td> <td></td> <td></td> </tr> <tr> <td>Exam preparation</td> <td></td> <td style="text-align: center;">90</td> </tr> <tr> <td style="text-align: center;"><b>Totals</b></td> <td></td> <td style="text-align: center;">90</td> </tr> </tbody> </table>									Total workload			Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)	<b>Contact time</b>	Lecture	4	60	<b>180</b>	<b>6</b>	Practical training	1	15	Exercise	1	15	<b>Totals</b>		4	90	<b>Independent study</b>	Preparation and follow-up			Exam preparation		90	<b>Totals</b>		90
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	Exam preparation		90																																							
	<b>Totals</b>		90																																							
<b>5 5.1 Qualification goals</b> <b>Professional skills:</b> <ul style="list-style-type: none"> <li>● The students have a basic understanding of the analysis and conceptual design of transport networks.</li> <li>● The students know the relevant regulations for the conceptual design, planning and organisation of transport networks and are able to work with them on a specific case.</li> <li>● The students understand different transport models depending on supply and demand and are able to apply them to specific cases.</li> </ul> <b>Methodological skills:</b> <ul style="list-style-type: none"> <li>● The students are able to assess and understand the impact of measures taken in transport networks.</li> </ul>																																										
<b>5.4 Content</b> <ul style="list-style-type: none"> <li>● Constituents of traffic systems,</li> <li>● collecting of traffic data, statistics, zoning, conducting, evaluation and interpretation of surveys,</li> <li>● the four-stage planning model, travel path optimisation models, models for optimising the travel route, regional distribution models,</li> <li>● transport-mode related distribution,</li> <li>● transport networks: fundamentals and concepts,</li> <li>● transport networks: application of concepts to case studies by using mathematical algorithms,</li> <li>● resource efficiency, transport algorithm for freight transport.</li> </ul>																																										

**Module description**

5	<b>5.3 Module summary</b> Why do we need a transport network? This module addresses and clarifies that question. The students will learn the fundamental building blocks of transport networks and will be able to design transport networks by using planning models and concepts.
6	<b>6.1 Prerequisites:</b> Required: good knowledge of the fundamentals of Road Engineering
	<b>6.2 Requirements for the award of credit points</b> Successful participation in the practical training as well as the group work, passing the written exam
	<b>6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)</b> Written exam (70%), practical training (10%), individual and group work (20%) or overall exam (100%)
	<b>6.4 Requirements for admission to the exam</b> Pre-exam achievements (PVL)
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input type="checkbox"/> German <input type="checkbox"/> English <input checked="" type="checkbox"/> Other, namely: Spanish
	<b>7.2 Coordination</b> s. lecturer overview UPV/EHU
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> s. lecturer overview UPV/EHU
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

<p>1 1.1 Module designation (dt. /engl.) Traffic Infrastructure</p>	<p>1.2 Short designation (optional)</p>	<p>1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0201.0.V.1</b></p>			
<p>2 2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)</p>	<p>2.2 Module duration: <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester</p>				
<p>3 3.1 Offer for the following degree programme(s)  Civil Engineering German-Spanish (BA)</p>	<p>3.2 Compulsory, compulsory elective, elective  Compulsory Compulsory</p>	<p>3.3 Recommended semester  7th semester 8th semester</p>			
<p>4 Workload</p>					
			<p>Total workload</p>		
<p>Semester 1</p>	<p>Teaching forms/ Form</p>	<p>Hrs. per form of teaching</p>	<p>Hrs. per semester per form of teaching/ specified form</p>	<p>Workload in hrs.</p>	<p>Credit points (Credits)</p>
	<p>Lecture</p>	<p>4</p>	<p>60</p>	<p><b>360</b></p>	<p><b>12</b></p>
	<p>Exercise</p>	<p>1</p>	<p>15</p>		
	<p>Seminar based teaching</p>	<p>1</p>	<p>15</p>		
	<p>Lecture</p>	<p>4</p>	<p>60</p>		
	<p>Exercise</p>	<p>1</p>	<p>15</p>		
	<p>Seminar based teaching</p>	<p>1</p>	<p>15</p>		
<p>Totals</p>		<p>4</p>	<p>180</p>		
<p>Independent study</p>	<p>Preparation and follow-up</p>				
	<p>Exam preparation</p>		<p>180</p>		
<p>Totals</p>			<p>180</p>		
<p>5 5.1 Qualification goals</p> <p><b>Professional skills:</b></p> <ul style="list-style-type: none"> <li>• The students know and understand the planning elements ground plan, site plan and elevation plan as well as their technical correlations.</li> <li>• The students know and understand the elements of a transversal route segment.</li> <li>• The students are able to recognise and evaluate the necessary earthworks resulting from the alignment of the route.</li> <li>• The students can derive the necessary drainage measures from the chosen alignment.</li> </ul> <p><b>Methodological skills:</b></p> <ul style="list-style-type: none"> <li>• The students are able to use the above knowledge to conceptualise, plan, construct and maintain roads.</li> </ul>					
<p>5.5 Content</p> <ul style="list-style-type: none"> <li>• Fundamentals of Traffic Engineering,</li> <li>• the geometric elements of ground plan, site plan and elevation plan,</li> <li>• coordination between site plan and elevation plan,</li> <li>• ground plans of transversal segments,</li> <li>• special transversal segments</li> <li>• earthworks,</li> <li>• pavements</li> <li>• hydrology and drainage.</li> </ul>					



**Module description**

5	<b>5.3 Module summary</b> The module covers the fundamental requirements for constructing and maintaining roads to a high standard of quality as a result of the interaction between the subsoil and demands as well as different construction materials, construction methods and construction processes.
6	<b>6.1 Prerequisites:</b> Required: good knowledge of the fundamentals of Construction Process Engineering
	<b>6.2 Requirements for the award of credit points</b> Successful participation in the practical trainings, passing the (partial) exams
	<b>6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)</b> 2 partial exams (35% each) and practical trainings (30%) or overall exam (100%)
	<b>6.4 Requirements for admission to the exam</b> Pre-exam achievements (PVL)
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input type="checkbox"/> German <input type="checkbox"/> English <input checked="" type="checkbox"/> Other, namely: Spanish
	<b>7.2 Coordination</b> s. lecturers' overview UPV/EHU
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> s. lecturers' overview UPV/EHU
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

1	1.1 Module designation (dt. /engl.) Company Internship I/II	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0201.0.V.1</b>																																					
2	2.1 Cycle: Offered <input type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semester																																						
3	3.1 Offer for the following degree programme(s)  Civil Engineering German-Spanish (BA)	3.2 Compulsory, compulsory elective, elective  Compulsory Compulsory	3.3 Recommended semester  7th semester 8th semester																																					
4	<table border="1"> <thead> <tr> <th colspan="4" data-bbox="820 546 1046 613">Workload</th> <th colspan="2" data-bbox="1046 546 1511 613">Total workload</th> </tr> <tr> <th data-bbox="820 613 1046 719"></th> <th data-bbox="1046 613 1163 719">Teaching forms/ Form</th> <th data-bbox="1163 613 1246 719">Hrs. per form of teaching</th> <th data-bbox="1246 613 1362 719">Hrs. per semester per form of teaching/ specified form</th> <th data-bbox="1362 613 1511 719">Workload in hrs.</th> <th data-bbox="1511 613 1511 719">Credit points (Credits)</th> </tr> </thead> <tbody> <tr> <td data-bbox="820 719 1046 864">Semester 1</td> <td data-bbox="1046 719 1163 864">Lecture</td> <td data-bbox="1163 719 1246 864">2</td> <td data-bbox="1246 719 1362 864">30</td> <td data-bbox="1362 719 1511 1240" rowspan="6" style="text-align: center; vertical-align: middle;"><b>540</b></td> <td data-bbox="1511 719 1511 1240" rowspan="6" style="text-align: center; vertical-align: middle;"><b>18</b></td> </tr> <tr> <td data-bbox="820 864 1046 1003">semester 2</td> <td data-bbox="1046 864 1163 1003"></td> <td data-bbox="1163 864 1246 1003">2</td> <td data-bbox="1246 864 1362 1003">30</td> </tr> <tr> <td data-bbox="820 1003 1046 1048">Totals</td> <td data-bbox="1046 1003 1163 1048"></td> <td data-bbox="1163 1003 1246 1048">4</td> <td data-bbox="1246 1003 1362 1048">60</td> </tr> <tr> <td data-bbox="820 1048 1046 1193" rowspan="2">Independent study</td> <td data-bbox="1046 1048 1163 1144">Preparation and follow-up</td> <td data-bbox="1163 1048 1246 1144"></td> <td data-bbox="1246 1048 1362 1144"></td> </tr> <tr> <td data-bbox="1046 1144 1163 1193">Exam preparation</td> <td data-bbox="1163 1144 1246 1193"></td> <td data-bbox="1246 1144 1362 1193">480</td> </tr> <tr> <td data-bbox="820 1193 1046 1240">Totals</td> <td data-bbox="1046 1193 1163 1240"></td> <td data-bbox="1163 1193 1246 1240"></td> <td data-bbox="1246 1193 1362 1240">480</td> </tr> </tbody> </table>			Workload				Total workload			Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)	Semester 1	Lecture	2	30	<b>540</b>	<b>18</b>	semester 2		2	30	Totals		4	60	Independent study	Preparation and follow-up			Exam preparation		480	Totals			480
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	Exam preparation		480																																					
Totals			480																																					
5	<p>5.1 Qualification goals</p> <p><b>Professional and methodological skills:</b></p> <ul style="list-style-type: none"> <li>The students are able to apply the knowledge and skills acquired during their studies in various disciplines to application-oriented activities and more complex problems in practice,</li> <li>to work out subject contents using specific problems as examples,</li> <li>identify and adjust the contribution of different disciplines to the solution of the problem.</li> </ul> <p><b>Personal and social skills:</b></p> <ul style="list-style-type: none"> <li>The students schedule their own activities independently and keep to given schedules.</li> <li>The students develop an independent decision-making ability.</li> </ul>																																							
	<p>5.6 Content</p> <ul style="list-style-type: none"> <li>Practical work experience in a Spanish company/business/authority in the transport or road sector with monitoring and taking on engineering tasks including courses accompanying the practical semester, presenting and writing a report.</li> </ul>																																							

**Module description**

5	<p><b>5.3 Module summary</b> Through a close interlinking of studies and professional practice, the students get the opportunity during the company internship to get to know application-oriented activities and to apply the knowledge and skills learned during their studies.</p>
6	<p><b>6.1 Prerequisites:</b> Required: basic and specialised subject knowledge of Transport Planning and Road Engineering. Useful: a successful exam in the subject area of the practical work.</p>
	<p><b>6.2 Requirements for the award of credit points</b> Certificate for the internship, submission and presentation of the internship reports</p>
	<p><b>6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)</b> Submission and presentation of the project reports</p>
	<p><b>6.4 Requirements for admission to the exam</b> Project report I and II (60 %) and report of the company supervisor (40 %)</p>
	<p><b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations</p>
7	<p><b>7.1 Course language/s</b> <input type="checkbox"/> German <input checked="" type="checkbox"/> English <input checked="" type="checkbox"/> Other, namely: Spanish</p>
	<p><b>7.2 Coordination</b> s. lecturers' overview UPV/EHU</p>
	<p><b>7.3 Lecturer(s)/Tutor(s): (optional)</b> s. lecturers' overview UPV/EHU</p>
	<p><b>7.4 Maximum number of participants (optional)</b></p>
	<p><b>7.5 Supplementary information (optional)</b></p>

1	1.1 Module designation (dt./engl.) <b>Bachelor Thesis</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.0019.0.A</b>	
2	2.1 Cycle: Offered <input checked="" type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester		
3	3.1 Offer for the following degree programme(s)	3.2 Compulsory, compulsory elective, elective	3.3 Recommended semester	
	Civil Engineering German-Spanish (BA)	Compulsory	8th semester	
4	Workload			Total workload
		Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form
	Contact time			
	Totals			
	Independent study	Independent study		300
	Totals			300
5	5.1 Qualification goals			
	<p><b>Professional skills:</b> The students can...</p> <ul style="list-style-type: none"> <li>independently deal with a practical engineering problem within a given period of time using familiar technical knowledge and present it appropriately.</li> <li>understand the connection between engineering planning and practical construction in the sense of a holistic approach.</li> </ul> <p><b>Methodological skills:</b> The students...</p> <ul style="list-style-type: none"> <li>demonstrate the ability to work independently on scientific problems, to adhere to the rules of the scientific methodology that applies to this subject matter, as well as to reflect on and critically assess the results obtained.</li> </ul> <p><b>Personal skills:</b> The students are able to...</p> <ul style="list-style-type: none"> <li>apply their knowledge of independently procuring information (literature, standards and company publications).</li> <li>write an engineering report.</li> </ul>			
5	5.2 Content			
<ul style="list-style-type: none"> <li>Individual practical engineering task,</li> <li>independent processing of the assigned task,</li> <li>regular reporting by the candidate on the structure and progress of the Bachelor thesis to the supervisor during the processing period.</li> </ul>				

**Module description**

5	<b>5.3 Module summary</b> The Bachelor thesis consists of the independent processing and appropriate presentation of a practical engineering task.
6	<b>6.1 Prerequisites:</b> Formal: Evidence of at least 120 CP
	<b>6.2 Requirements for the award of credit points</b> Successful completion of the bachelor thesis
	<b>6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes)</b> Bachelor thesis
	<b>6.4 Requirements for admission to the exam</b> Evidence of at least 120 CP (s. 6.1)
	<b>6.5 Assessment pattern in determining the final grade</b> As defined by exam regulations
7	<b>7.1 Course language/s</b> <input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input checked="" type="checkbox"/> Other, namely: Spanish
	<b>7.2 Coordination</b> All professors of the department of Civil Engineering UPV/EHU
	<b>7.3 Lecturer(s)/Tutor(s): (optional)</b> All professors of the department of Civil Engineering UPV/EHU
	<b>7.4 Maximum number of participants (optional)</b>
	<b>7.5 Supplementary information (optional)</b>

1	1.1 Module designation (dt. /engl.) <b>Colloquium</b>	1.2 Short designation (optional)	1.3 Modul-Code (aus HIS-POS) <b>BAU.1.00183.0.Q</b>		
2	2.1 Cycle: Offered <input checked="" type="checkbox"/> every summer term, <input checked="" type="checkbox"/> every winter term, <input type="checkbox"/> other, namely (summer + winter term)	2.2 Module duration: <input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester			
3	3.1 Offer for the following degree programme(s)	3.2 Compulsory, compulsory elective, elective	3.3 Recommended semester		
	Civil Engineering (BA)	Compulsory	6th semester		
	Civil Engineering PLUS (BA)	Compulsory	7th semester		
	Civil Engineering dual (BA)	Compulsory	8th semester		
	Civil Engineering dual PLUS (BA)	Compulsory	9th semester		
4	Workload				
				Total workload	
	Teaching forms/ Form	Hrs. per form of teaching	Hrs. per semester per form of teaching/ specified form	Workload in hrs.	Credit points (Credits)
	Contact time			<b>60</b>	<b>2</b>
	Totals				
	Independent study	Preparation and follow-up			
		Exam preparation	60		
	Totals		60		
5	5.1 Qualification goals <b>Professional, methodological and personal skills:</b> The students are able to... <ul style="list-style-type: none"> <li>• present their Bachelor thesis appropriately and explain the technical background.</li> <li>• apply the acquired presentation and discussion techniques to present the results of their work.</li> </ul>				
5	5.2 Content <ul style="list-style-type: none"> <li>• Presentation and discussion of the Bachelor's thesis.</li> </ul>				

### Module description

5	5.3 Module summary The colloquium serves to present and explain the Bachelor' s thesis appropriately by using the acquired presentation and discussion techniques.
6	6.1 Prerequisites: Formal: all module exams of the degree programme including the practical phase/practical semester must have been successfully concluded, the Bachelor thesis must have been assessed with at least "sufficient".
	6.2 Requirements for the award of credit points Successful completion of the colloquium
	6.3 Forms and scope of exam (e.g. written exam, oral exam, term paper, presentation, portfolio, duration of exam in minutes) Colloquium
	6.4 Requirements for admission to the exam All module exams of the degree programme including the practical phase/practical semester must have been successfully concluded, the Bachelor thesis must have been assessed with at least "sufficient".
	6.5 Assessment pattern in determining the final grade As defined by exam regulations
7	7.1 Course language/s <input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input checked="" type="checkbox"/> Other, namely: Spanish

## 7.2 Coordination

All professors of the department of Civil Engineering

## 7.3 Lecturer(s)/Tutor(s): (optional)

All professors of the department of Civil Engineering

## 7.4 Maximum number of participants (optional)

## 7.5 Supplementary information (optional)