

Appendix 2: Course forms of the modules

As of: 30 July 2018

Overview of the modules in the bachelor's degree study programme in Civil Engineering

Syn.	Module	Sub-sections, if applicable	Module coordinator	Teaching staff	Sem.	Course time	Self-study	Lect	Exerc	CP	Exam
1st–3rd semester: Basic Knowledge											
Compulsory Subjects											
	Introduction for First-Semester Students		Wißmann	Wißmann							
	Maths Fitness		Peters	Peters							
Sy1	Fundamentals of Building Construction*		Sassenroth	Ackerm., Sassenr.	1st/2nd	120	150	4	4	9	Term paper/Written exam
Sy2	Technology of Building Materials		Twelmeier	Twelmeier	1st/2nd	90	150	2	4	8	Term paper/Written exam
	Mathematics 1		Peters	Peters	1st	60	90	2	2	5	Written exam
	Mathematics 2		Peters	Peters	2nd	60	90	2	2	5	Written exam
Sy6	Applied Computer Science		Eisfeld	Eisfeld	1st	60	90	1	2	5	Term paper/Written exam
	Hydromechanics		Kahlfeld	Kahlfeld	2nd	60	90	2	2	5	Term paper/Written exam
Sy12	Construction Management 1		Nister	Nister	2nd	60	90	2	2	5	Written exam
	Technical Mechanics 1		Wißmann	Wißmann	1st	90	120	3	3	7	Written exam
	Technical Mechanics 2	Statics Strength of Materials	Wißmann	Wißmann Peters	2nd 2nd	90	120	3	3	7	Written exam
Sy5	Land Surveying		Weitkemper	Nobbe	1st	60	90	1	3	5	Term paper/written examination or term paper/oral examination
	Introduction to Engineering Skills – ItES/Descript. Geom.		N.N.	N.N.	3rd	90	60	3	3	5	Term paper/Written exam
	ItES/Statical Calculation (only WGAV + B)		N.N.	Wißmann	3rd	90	60	3	3	5	Term paper/Written exam
Sy4b	Technical English		Stones	Stones	3rd	60	90		4	5	Written exam
	Specialisation Advice		Weitkemper	Weit/Kahlf/Nister	2nd					-	-
3rd–5th semester: Specialist Knowledge											
Compulsory Modules											
	Statical Calculation 1 (only K)		Wißmann	Wißmann	4th	60	90	2	2	5	Written exam
	Design of Reinforced Concrete and Masonry Structures		Weitkemper	Weitkemper	3rd/4th	150	150	5	5	10	Term paper/Written exam
	Steel Construction 1		Peters	Peters	3rd	60	90	2	2	5	Term paper/Written exam
Sy9	Building Physics 1*		Ackermann	Ackermann	3rd/4th	60	90	4	2	6	Written exam
Sy17	Hydraulic Structures and Hydrology 1		Kahlfeld	Kahlfeld	3rd	60	90	2	2	5	Term paper/Written exam
Sy30	Water and Sanitation 1		Weinig	Weinig	3rd	60	90	2	2	5	Term paper/Written exam
	Timber Construction 1*		N.N.	N.N.	4th	60	90	2	2	5	Term paper/Written exam
Sy16	Construction Management 2		Nister	Nister	3rd	60	90	2	2	5	Term paper/Written exam
	Geotechnics 1 – BM		Gülzow	Gülzow	4th	60	60	2	2	4	Term paper/written examination or term paper/oral examination
	Geotechnics 2 – GB		Gülzow	Gülzow	5th	60	60	2	2	4	Term paper/written examination or term paper/oral examination
Sy31	Traffic Engineering 1		Kahlfeld	Handke	5th	60	90	2	2	5	Term paper/Written exam
Elective Specialist Knowledge 25 CP, Focus 20 CP										25	
Structural Engineering (K)											
	Statical Calculation 2 (Compulsory)		Wißmann	Wißmann	5th	60	90	2	2	5	Term paper/Written exam
	FEA Application		Wißmann	Wißmann	6th	90	60	1	5	5	Term paper/oral examination
	Design of Reinforced Concrete Structures		Weitkemper	Weitkemper	5th/6th	60	90	2	3	5	Term paper/Written exam
	Prestressed and Precast Concrete Structures		Weitkemper	Weitkemper	5th/6th	60	90	2	3	5	Term paper/Written exam
	Steel Construction 2		Peters	Peters	5th/6th	60	90	2	3	5	Term paper/Written exam
	Timber Construction 2*		N.N.	N.N.	5th/6th	60	90	2	3	5	Term paper/Written exam
Sy19	Building Physics 2*		Ackermann	Ackermann	5th/6th	60	90	1	2	5	Term paper
Construction Management (B)											
Sy24	Construction Management 3 (Compulsory)		Nister	Nister	4th	60	90	2	2	5	Written exam
Sy26	Business Management		Kathmann	Kathmann	5th/6th	60	90	2	2	5	Term paper or written exam
Sy27	Construction Methods and Procedures in Building Construction*		Kathmann	Kathmann	5th/6th	60	90	2	2	5	Term paper
Sy25	Organisation and Contract Drafting in Construction Projects		Nister	Nister	5th/6th	60	90	2	2	5	Written exam
Sy18	Occupational Safety		Nister	LA Hanslik	5th	60	90	2	2	5	Oral examination/Written examination
Sy13	Law*		Mons	LA Zülka/Witt	5th	60	90	2	2	5	K

	Practical Training (pro rata with 5 CP)		Nister	Nister	6th							
	Water Management, Geotechnics, Waste Management and Traffic Engineering (WGAV)											
	Water and Soil analysis (Compulsory)		Weinig	Weinig	4th	60	90	2	2	5		Term paper/Written exam
	Waste and Resource Management (Compulsory)		Weinig	Weinig	5th	60	90	2	2	5		Term paper/Written exam
	Hydraulic Structures 2		Kahlfeld	Kahlfeld	5th/6th	60	90	2	2	5		Term paper/Written exam
	Hydrology and Sewerage Systems 2		Weinig	LA Kohut/Weinig	5th/6th	60	90	2	2	5		Term paper/Written exam
	Water and Sanitation 2		Weinig	Weinig	5th/6th	60	90	2	2	5		Term paper/written examination or term paper/oral examination
	Water and Sanitation 3		Weinig	Weinig	5th/6th	60	90	2	2	5		Term paper/written examination or term paper/oral examination
	Advanced Studies in Geotechnics		Gülzow	Gülzow	5th/6th	60	90	2	2	5		Written or oral examination
Sy32	Traffic Engineering 2		Kahlfeld	Handke	5th/6th	60	90	2	2	5		Written or oral examination
Cross-Focus												
Sy24	Construction Management 3 (Compulsory)		Nister	Nister	4th	60	90	2	2	5		Written exam
Sy20	Business Administration 1		Ebel	LA Hoppe	5th	60	90	2	2	5		Written exam
	Advanced Studies in Geotechnics		Gülzow	Gülzow	5th/6th	60	90	2	2	5		Written or oral examination
Sy18	Occupational Safety		Nister	LA Hanslik	5th	60	90	2	2	5		Written exam
Sy13	Law	Priv./Public Law	Mons	LA Witt	5th	60	90	4		5		Written exam
		Building Contracts		LA Zülka/Witt	5th							
	2nd Language Module, e.g:											
Sy21	English Correspondence		Stones	Stones	5th/6th	60	90		4	5		Written exam
Sy22	English Presentations		Stones	Stones	5th/6th	60	90		4	5		Written exam
Sy8	Russian 1		Behrens	Kretschmar	5th/6th	60	90		4	5		Written exam
Sy7	Spanish 1		Ackermann	Garcia	5th/6th	60	90		4	5		Written examination + oral examination
	Maintenance, Repair ...		Weinig	Weinig	5th/6th	60	90	2	2	5		Term paper/written examination or term paper/oral examination
5th/6th semester												
	Work-Related Project				4th/5th	30	210		2	8		Combination exam (term paper and presentation)
	optionally in focus	K	Weitkemper	Weitkemper								Project work
	or	WGAV	Weinig	Weinig								Project work
	Practical Training (only Construction Management)	B	Nister	Nister	6th	30	360				13	Project work
	Bachelor Thesis* (2 months)						360				12	
	Total 1st–6th semester (bachelor)											180

A maximum of one "2nd language module" can be credited.

Sy: Course is run in tandem with one in another study programme

*Translations of these module descriptions are currently not available.

Please note: The German version of this document is the legally binding version. The English translation provided here is for information purposes only.

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Waste and Resource Management								Abbr.
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	5th sem.	Annual	Winter	1 sem.	Compulsory	
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture Sem. lessons Exercise		2 SCH/30 h	45 h	Lecture			German
	Practical / Seminar		2 SCH / 30 h	45 h	Group work		≤ 15	German
2	Learning outcomes / competences Planning, design, construction and operation of waste treatment plants. Organise waste logistics, waste prevention, waste recycling, resource conservation and energy use.							
3	Contents Connection between waste and circular economy. Legal regulations. Waste management objectives, waste quantities, collection, transport and handling. Mechanical-biological pre-treatment. Landfill technology and landfill operation. Waste prevention, composting, technical gas purification and energy generation. Thermal and anaerobic processes. Material cycles and recycling processes.							
4	Participation requirements None							
5	Form of assessment Term paper incl. presentation and written exam							
6	Condition for the award of credit points Successful completion of the examination							
7	Application of the module (in the following study programmes): Civil Engineering (B.Eng.) – Specialisation: Water Management, Geotechnics, Waste Management and Traffic Engineering – and Infrastructure Engineering (B.Eng.)							
8	Module coordinator Prof. Dr Johannes Weinig							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Applied Computer Science								Abbr. AI
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	1st sem.	Annual	Winter	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture Sem. lessons		2 SCH / 30 h	40 h	Lecture		60	German
	Exercise		1 SCH / 15 h	25 h	Group work		15–20	German
	Practical		1 SCH / 15 h	25 h	Individual work		15	German
2	Learning outcomes / competences							
	Computer science sub-module: Teaching conceptual knowledge of data processing using computers. Understanding of how a computer works – both hardware and the different layers of software. Presentation of algorithms as a representation of sequential knowledge of mathematical models. Ability to build models using the concepts learnt							
	CAD sub-module: Teaching skills in modern computer-aided drafting. Understanding the graphical behaviour of model objects as well as visualising them on a computer. Acquisition of technology for drawing and modelling structures in conformity with standards.							
3	Contents							
	Computer science sub-module: Structure of a computer, elementary number systems and operations defined using them as well as languages based on them with their data types, modelling, trees and graphs, propositional logic, algorithms on these data types and structures, process descriptions using automata							
	CAD sub-module: Functioning of modern CAD systems for the graphic and informational modelling of structures as well as their construction elements, creation and editing of model objects on the computer of varying complexity, starting with simple objects, through more complex components with auxiliary constructions, to complete model drawings of buildings with dimensioning and plan frames. Derivation of elevations, sectional views and floor plans, taking into account DIN 1356 with regard to correct line widths, line types, hatchings and scales.							
4	Participation requirements							
	None							
5	Form of assessment							
	Subject-related and methodical in the form of a written examination as well as independently in the form of a term paper							
6	Condition for the award of credit points							
	Passed written exam as well as successfully completed term paper, proven participation in the exercises							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Eisfeld							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Introduction to Engineering Skills (ItES) / Descriptive Geometry								Abbr.
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	3rd sem.	Annual	Winter	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		3 SCH / 45 h	30 h	Lecture		≤ 35	German
	Sem. lessons		3 SCH / 45 h	30 h	Exercise + independent work			German
	Exercise							
	Practical / Seminar							
2	Learning outcomes / competences							
	ItES sub-section: Creation of drawings for civil engineering; construction of static positions and static calculations; construction of load compositions (dead, live, snow and wind loads); Determination of decisive impact combinations on components and structures taking into account the agreements according to DIN EN 1990; instructions for self-study							
	Descriptive geometry sub-section: Work out basic geometric constructions and third-angle constructions, taking into account different line widths and line types							
3	Contents							
	General information on drafting systems (line types, line widths, hatching) for drawings in civil engineering; structure of static calculations; contents of execution plans in civil engineering; static systems of load-bearing structures in structural engineering; preliminary design of load-bearing structures of structural engineering in different materials Development of the semi-probabilistic safety concept; determination of the effects on structures according to DIN EN 1991-1, determination of decisive combinations of effects for structural components of buildings Guidance for independent expansion of the contents with the aid of standardisation and literature.							
4	Participation requirements							
	None							
5	Form of assessment							
	Term paper and written exam							
6	Condition for the award of credit points							
	Passed term paper with written exam in accordance with 5							
7	Application of the module (in the following study programmes):							
	Engineering skills are a prerequisite for all modules dealing with the design of components and load-bearing structures Civil Engineering (B.Eng.) – Specialisation Structural Engineering							
8	Module coordinator							
	N.N.							
9	Other information							
	Exemption: Until further revision of the module, the contact time is increased by 2 SCH. The time for self-study is reduced accordingly.							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Introduction to Engineering Skills/Descriptive Geometry/Statical Calculation								Abbr.
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	3rd sem.	Annual	Winter	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		3 SCH / 45 h	30 h	Lecture		≤ 35	German
	Sem. lessons		3 SCH / 45 h	30 h	Exercise + independent work			German
	Exercise							
	Practical / Seminar							
2	Learning outcomes / competences							
<p>ItES sub-section: Preparation of drawings in civil engineering; structure of static positions and static calculations; structure of load compositions (dead, live, snow and wind loads); determination of decisive combinations of effects on components and structures, taking into account the agreements according to DIN EN 1990; instructions for self-study</p> <p>Descriptive geometry sub-section: Work out basic geometric constructions and third-angle constructions, taking into account different line widths and line types</p> <p>Statical calculation sub-section: The students can apply the principle of virtual forces and use it to calculate internal forces on statically indeterminate systems.</p>								
3	Contents							
<p>ItES and Descriptive Geometry sub-section (6 SCH): General information on drafting techniques (line types, line widths, hatching) for drawings in civil engineering; structure of static calculations; contents of execution plans in civil engineering; static systems of load-bearing structures in structural engineering; preliminary design of load-bearing structures of structural engineering in different materials</p> <p>Development of the semi-probabilistic safety concept; determination of the effects on structures according to DIN EN 1991-1, determination of decisive combinations of effects for structural components of buildings</p> <p>Guidance for independent expansion of the contents with the aid of standardisation and literature.</p> <p>Statical calculation sub-section (2 SCH): Internal force determination on statically indeterminate systems: Principle of virtual forces, build-up method, force method.</p>								
4	Participation requirements							
Confident application of the contents of Mechanics 1, knowledge of the contents of Mechanics 2								
5	Form of assessment							
Term paper and written exam								
6	Condition for the award of credit points							
Passed term paper with written exam in accordance with 5								
7	Application of the module (in the following study programmes):							
Civil Engineering (B.Eng.) – Specialisations WGAV and Construction Management								
8	Module coordinator							
Prof. Dr.-Ing. Britta Wißmann								
9	Other information							
Exemption: Until further revision of the module, the contact time is increased by 2 SCH. The time for self-study is reduced accordingly.								

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Occupational Safety								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	5th sem.	Annual	Winter	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		4 SCH/60 h	90h	Lecture		120	German
2	Learning outcomes / competences							
	<p>On successful completion of the module, students have the following knowledge and skills: They are able to</p> <ul style="list-style-type: none"> - recognise and solve safety-related problems on construction sites by applying the legal regulations. - apply OSH expertise within the framework of special requirement profiles (such as SIGEKO). - demonstrate partial knowledge of the qualification "Occupational Safety Specialist". 							
3	Contents							
	<ul style="list-style-type: none"> - Social security system and legal bases in occupational health and safety - Responsibility and liability of the project participants - Control system Occupational health and safety management system (AMS) Construction - Handling of work equipment - Safety and personal protective equipment (PPE) when carrying out work - Occupational health and safety in the EU framework and RAB regulations (rules on occupational health and safety on construction sites) 							
4	Participation requirements							
	Basic knowledge of the use of construction equipment and the implementation of construction procedures							
5	Form of assessment							
	Written examination							
6	Condition for the award of credit points							
	Module examination pass							
7	Application of the module (in the following study programmes):							
	Project Management Construction (B.Eng.); Civil Engineering (B.Eng.); Infrastructure Engineering (B.Eng.); Architecture (B.A.)							
8	Module coordinator							
	Prof. Dr.-Ing. Oliver Nister							
9	Other information							
	The course is run by the employers' liability insurance association. The training will not take place at Bielefeld University of Applied Sciences. Students are required to be physically present at the training site.							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Construction Management 1								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	2nd sem.	Annual	Summer	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	45 h	Lecture		60	German
	Sem. lessons							
	Exercise		2 SCH/30 h	45 h	Seminar lessons		25	German
	Practical / Seminar							
2	Learning outcomes / competences							
	<p>On successful completion of the module, students have the following knowledge and skills: They are able to</p> <ul style="list-style-type: none"> - explain the basics of the business of construction and its economic framework. - assign those involved in construction their respective tasks in the planning and construction process. - explain common construction methods by way of example. 							
3	Contents							
	<ul style="list-style-type: none"> - Basics of construction management - General conditions in the construction industry - Project participants and their tasks - Forms of project organisation - Presentation of examples of construction methods 							
4	Participation requirements							
	None							
5	Form of assessment							
	Written examination							
6	Condition for the award of credit points							
	Module examination pass							
7	Application of the module (in the following study programmes):							
	Project Management Construction (B.Eng.); Civil Engineering (B.Eng.); Infrastructure Engineering (B. Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Oliver Nister							
9	Other information							
	-							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Construction Management 2								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	3rd sem.	Annual	Winter	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		planned Group size	Language
	Lecture		2 SCH/30 h	45h	Lecture		60	German
	Sem. lessons							
	Exercise		2 SCH/30 h	45h	Supervised group work		24	German
Practical / Seminar								
2	Learning outcomes / competences							
	<p>On successful completion of the module, students have the following knowledge and skills: They are able to</p> <ul style="list-style-type: none"> - independently draw up a construction service contract taking into account construction management and economic aspects. - understand essential legal aspects. - explain the procurement process of public and private contracting authorities. - use the construction contract as a management tool in construction projects. - determine the contractually owed construction target and identify supplementary potential on its merits. 							
3	Contents							
	<ul style="list-style-type: none"> - Basics of construction contract management - Awarding of construction works by public and private contracting authorities - Preparation of specifications with service specifications and service programme - AVB, ZVB, BVB, ATV, ZTV - Quantity determination and invoice verification on the basis of generally recognised rules of technology - Determination of the construction goal and interpretation of construction contracts 							
4	Participation requirements							
	Basic knowledge of construction management and construction industry contexts							
5	Form of assessment							
	Written examination and term paper							
6	Condition for the award of credit points							
	Module examination pass							
7	Application of the module (in the following study programmes):							
	Project Management Construction (B.Eng.); Civil Engineering (B.Eng.); Infrastructure Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Oliver Nister							
9	Other information							
	-							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Construction Management 3								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	4th sem.	Annual	Summer	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	45h	Lecture		60	German
	Sem. lessons							
	Exercise		2 SCH/30 h	45h	Seminar lessons		24	German
Practical / Seminar								
2	Learning outcomes / competences							
	<p>On successful completion of the module, students have the following knowledge and skills: They are able to</p> <ul style="list-style-type: none"> - determine and evaluate the duration of operations in construction. - independently prepare schedules for construction projects from the perspective of the client and the contractor. - apply common costing methods in the construction industry. - calculate service specifications with service descriptions. - identify potential for additional costs and assess them from a costing perspective. 							
3	Contents							
	<ul style="list-style-type: none"> - Basics of scheduling / effort values - Bar and network scheduling plans - Basics of costing in the construction industry - Calculation of the final bid amount - Calculation with pre-calculated surcharges - Calculation in turnkey construction - Identify and evaluate modified and additional services 							
4	Participation requirements							
	Basic knowledge of construction management and construction industry interrelationships, knowledge of construction contract design and the AVA process in the construction industry							
5	Form of assessment							
	Written examination							
6	Condition for the award of credit points							
	Module examination pass							
7	Application of the module (in the following study programmes):							
	Project Management Construction (B.Eng.); Civil Engineering (B.Eng.); Infrastructure Engineering (B. Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Oliver Nister							
9	Other information							
	-							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Organisation and Contract Drafting in Construction Projects								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	5th sem.	Annual	Winter	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	45h	Lecture		60	German
	Sem. lessons							
	Exercise		2 SCH/30 h	45h	Seminar lessons		25	German
	Practical / Seminar							
2	Learning outcomes / competences							
	On successful completion of the module, students have the following knowledge and skills: They are able to <ul style="list-style-type: none"> - set up a project organisation under different objectives and framework conditions. - handle a construction project in accordance with VOB and other contractual/legal regulations. - develop effective supplementary contract management from the perspective of the client and the contractor. - Analyse options for action of project participants under institutional and behavioural economic aspects. 							
3	Contents							
	<ul style="list-style-type: none"> - Structural organisation and workflow management - Knowledge of the tasks and activities of construction management/project management - Instruments of construction management/project management - Application of the VOB/B under construction management and economic aspects - Supplementary contract management from the perspective of the client and the contractor - Institutional and behavioural economic foundations 							
4	Participation requirements							
	Basic knowledge of construction management and construction economics, knowledge of contract design, the AVA process, scheduling and costing in the construction industry							
5	Form of assessment							
	Written examination							
6	Condition for the award of credit points							
	Module examination pass							
7	Application of the module (in the following study programmes):							
	Project Management Construction (B.Eng.); Civil Engineering (B.Eng.); Infrastructure Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Oliver Nister							
9	Other information							
	-							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Statical Calculation 1								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	4th sem.	Annual	Summer	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	90h	Lecture			German
	Sem. lessons							
	Exercise Practical / Seminar		2 SCH/30 h		Exercise + independent work		≤ 20	German
2	Learning outcomes / competences							
	The students get to know the concept of virtual work. They can apply principles of virtual work to determine lines of influence of statically determinate systems and to calculate internal forces on statically indeterminate systems.							
3	Contents							
	Kinematics: Pole plans and displacement figures. Virtual work. Principle of virtual displacements, lines of influence. Principle of virtual forces, force method.							
4	Participation requirements							
	Confident application of the contents of Mechanics 1, knowledge of the contents of Mechanics 2							
5	Form of assessment							
	Written examination							
6	Condition for the award of credit points							
	Passed written exam acc. to 5							
7	Application of the module (in the following study programmes):							
	Knowledge of the fundamentals of statical calculation is a prerequisite for the subject "Statical Calculation 2" in the "Structural Engineering" specialisation.							
8	Module coordinator							
	Prof. Dr.-Ing. B. Wißmann							
9	Other information							
	-							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Statical Calculation 2								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	5th sem.	Annual	Winter	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self- study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	90 h	Lecture			German
	Sem. lessons							
	Exercise Practical / Seminar		2 SCH/30 h		Exercise + independent work		≤ 20	German
2	Learning outcomes / competences							
	The students learn to determine internal forces on statically indeterminate systems using the displacement method. They understand the influence of second theory order on displacive systems and can calculate the internal forces according to second theory order. Students can analyse systems under special loads and with elastic springs using the force method.							
3	Contents							
	Displacement methods on non-displacive and displacive systems, second theory order. Special loads: Temperature, turnbuckles, bearing sinking. Elastic springs. Building practical systems.							
4	Participation requirements							
	Reliable application of the contents from Mechanics and Statical Calculation 1							
5	Form of assessment							
	Term paper and written exam							
6	Condition for the award of credit points							
	Passed examination acc. to 5							
7	Application of the module (in the following study programmes):							
	In-depth knowledge of statical calculation is a prerequisite for the module "FEA Application" in the "Structural Engineering" specialisation.							
8	Module coordinator							
	Prof. Dr.-Ing. B. Wißmann							
9	Other information							
	-							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Technology of Building Materials								Abbr.
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	240 h	8	1st + 2nd sem.	Annual	Winter + summer	2 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)	Planned group size	Language	
	Lecture		2 SCH/30 h	45 h	Lecture		German	
	Sem. lessons		2 SCH/30 h	45 h	Seminar + exercise	< 35	German	
	Exercise							
	Lab Practical		2 SCH/30 h	30 h + 30 h	Presentation + group work	< 12	German	
2	Learning outcomes / competences Describe the origin/production and possible uses of important building materials; state advantages and disadvantages or limits of use within the application of building materials; define objectives in the development of construction solutions in everyday working life; determine and apply short building material designations and design values; explain significant incompatibilities and formulate the possible uses; carry out and compare common building material tests and possible quick tests; describe technical problems and present technical approaches to solutions; argue as well as evaluate and conclude for a binding use of building materials; derive a necessary ability to self-criticism for the regularly required questioning of selection, testing and calculation procedures under constantly changing construction conditions.							
3	Contents Introduction to the use of building materials in construction (including historical developments); extraction, production and use of relevant building materials; typical and potentially harmful basic chemical reactions during production; chemical and physical behaviour of binders and building materials in construction; methods of practical calculation of compositions and characteristic values of building materials; testing and assessment through construction site or laboratory tests within the application; aspects of durability and corrosion behaviour as well as environmental and health compatibility; application of associated standards and other regulations as well as literature sources Primarily for: Natural stone, aggregates, binders, concrete, artificial stones, steel and wood							
4	Participation requirements None							
5	Form of assessment Combination exam: Term paper (consisting of a presentation in the laboratory practical and submission of the evaluation of all laboratory protocols in the laboratory portfolio submitted), Written examination							
6	Condition for the award of credit points Proven participation in the laboratory practicals and passing the module examination							
7	Application of the module (in the following study programmes): Architecture (B.A.), Civil Engineering (B.Eng.), Project Management Construction (B.Eng.) and Infrastructure Engineering (B.Eng.)							
8	Module coordinator Prof. Dr.-Ing. Heiko Twelmeier							
9	Other information -							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Business Administration 1								Abbr.
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5		Annual	Winter	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		45 h	60 h			120	German / English
Exercise		15 h	30 h			120	German / English	
2	Learning outcomes / competences After completing the module, the students have an overview of the field of business administration. They know the fundamental control variables, methods and instruments of business administration as well as the necessary terminology. They can also transfer their knowledge to applications and tasks in business administration in the construction industry and explain them.							
3	Contents <ul style="list-style-type: none"> • Fundamentals and basic terms of business administration • Introduction to economic thinking • Legal influencing factors • Phases of corporate development • Legal forms of the companies • Mergers and acquisitions • Functions of business administration • Business organisation <input type="checkbox"/> Business plan							
4	Participation requirements None							
5	Form of assessment Written examination							
6	Condition for the award of credit points Module examination pass							
7	Application of the module (in the following study programmes): Architecture (B.A.), Project Management Construction (B.Eng.), Infrastructure Engineering (B.Eng.)							
8	Module coordinator Prof. Dr.-Ing. Gerald Ebel							
9	Other information Teaching is carried out by a lecturer.							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Specialisation Advice								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	-	-	2nd sem.	Annual	Summer	-	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		planned Group size	Language
	Lecture Sem. lessons Exercise Practical / Seminar							
2	Learning outcomes / competences							
	The student has knowledge in the basic subjects of the first two semesters and is able to differentiate the subject orientation of the offered specialisations in the main features.							
3	Contents							
	In each case, the student will reflect on the essential contents of the 4 basic modules <ul style="list-style-type: none"> - Building materials science - Building construction - Construction management - Hydromechanics and more perspectives on the 3 directions of in-depth study will be given.							
4	Participation requirements							
	Knowledge of the subject content of the first two semesters							
5	Form of assessment							
	-							
6	Condition for the award of credit points							
	-							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Uwe Weitkemper (Vice Dean)							
9	Other information							
	The advice appointments are held by representatives of the 3 specialisations at the end of the 2nd semester.							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Introduction for First-Semester Students								Abbr.
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	-	-	1st sem.	Annual	Winter	1 week	elective	BA / M
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		planned Group size	Language
	Lecture Sem. lessons Exercise Practical / Seminar		One-week introduction + classes in the 2nd week		Lecture Exercises and tutorials Excursions Projects			German
2	Learning outcomes / competences Students get to know their university campus. They become familiar with the basic conditions of the degree programme and gain knowledge of the course schedule and examination procedures as well as the exchange of information on campus.							
3	Contents The faculty, its facilities and the venue of study, Minden Structure of the study programmes, timetables Introduction to the faculty library and how to use it Information on the university organisation and the student self-governing bodies Introduction to data processing Safety briefings							
4	Participation requirements Acceptance letter							
5	Form of assessment No examination							
6	Condition for the award of credit points -							
7	Application of the module (in the following study programmes): This module can be used in all study programmes.							
8	Module coordinator Prof. Dr.-Ing. B. Wißmann							
9	Other information Introductory events by tutors (students from higher semesters from the individual degree programmes), professors and academic staff from the various fields of study, safety officers, etc.							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Technical English								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	3rd sem.	Annual	Winter	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)	Planned group size	Language	
	Lecture Sem. lessons Exercise Practical / Seminar		4 SCH/60 h	90 h	Sem. lesson/Exercise	25 (≤ 35)	English	
2	Learning outcomes / competences							
	On successful completion of the module, students have the following knowledge and skills: <ul style="list-style-type: none"> • They can understand and summarise construction-related English-language texts and documents • They are able to communicate in English with colleagues in meetings about construction projects • They can make telephone calls in English • They can produce simple written documents in English about construction projects • They are able to use English technical vocabulary in their profession 							
3	Contents							
	<ul style="list-style-type: none"> • Professions in the construction industry • Components and building constructions (e.g. foundation, roof) • Building materials • Drawings and plans • Negotiations with clients • Tenders and contracts • Construction sites and construction organisation • Telephone communication 							
4	Participation requirements							
	None							
5	Form of assessment							
	Written exam							
6	Condition for the award of credit points							
	Module examination pass							
7	Application of the module (in the following study programmes):							
	Project Management Construction (B.Eng.), Infrastructure Engineering (B.Eng.), Architecture (B.A.), Civil Engineering (B.Eng.),							
8	Module coordinator							
	Cathrine Stones							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

2nd Language Module – English Correspondence								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	5th sem.	Annual	Winter	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)	Planned group size	Language	
	Lecture Sem. lessons Exercise Practical/Seminar		4 SCH/60 h	90 h	Sem. lesson/Exercise	25	English	
2	Learning outcomes / competences On successful completion of the module, students have the following knowledge and skills: <ul style="list-style-type: none"> • They can understand and summarise written communication in English about construction projects • They are able to use the forms of international professional correspondence • They are able to conduct external and internal correspondence for project planning and project implementation in English • They can read English-language contracts with critical attention • They can write CVs and application letters in English 							
3	Contents Exercises in writing <ul style="list-style-type: none"> • Business letters • Applications • CVs • Emails Using case studies and texts on topics such as <ul style="list-style-type: none"> • Tendering and construction contracts • Building organisation • Construction planning • Payments in the construction industry 							
4	Participation requirements Formally: none. In terms of content, knowledge of the module "Technical English" is assumed.							
5	Form of assessment Written exam							
6	Condition for the award of credit points Module examination pass							
7	Application of the module (in the following study programmes): Project Management Construction (B.Eng.), Infrastructure Engineering (B.Eng.), Architecture (B.A.) Civil Engineering (B.Eng.)							
8	Module coordinator Cathrine Stones							
9	Other information							

**Module catalogue for the bachelor's degree study programme in civil engineering
of the Faculty of Minden Campus**

2nd Language Module – English Presentations								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	4th/6th sem.	Annual	Summer	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)	Planned group size	Language	
	Lecture Sem. lessons Exercise Practical/Seminar		4 SCH/60 h	90 h	Sem. lesson/Exercise	25	English	
2	Learning outcomes / competences On successful completion of the module, students have the following knowledge and skills: <ul style="list-style-type: none"> • Students are able to create and conduct a presentation in English in an international professional context • They can adapt the language register used to the listeners' knowledge of English and adapt the tone to their level of awareness • They are able to apply learned linguistic structures and conventions that make the presentation more accessible to the audience 							
3	Contents <ul style="list-style-type: none"> • Presentation techniques • Structuring and "signposting" • Presenting facts and data • Intonation and articulation • Dealing with questions • Correct choice of tone (formal – casual) • Linguistic use of visual aids • Literature research and familiarisation with independently selected construction-related presentation themes 							
4	Participation requirements Formally: none. In terms of content, knowledge of the module "Technical English" is assumed.							
5	Form of assessment Combination exam: Oral examination (70%) and written examination (30%)							
6	Condition for the award of credit points Module examination pass							
7	Application of the module (in the following study programmes): Project Management Construction (B.Eng.), Infrastructure Engineering (B.Eng.), Architecture (B.A.), Civil Engineering (B.Eng.)							
8	Module coordinator Cathrine Stones							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

FEA Application								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	6th sem.	Annual	Summer	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture Sem. lessons Exercise Practical / Seminar		1 SCH / 15 h 3 SCH / 45 h	90h	Lecture Independent work		 8	German German
2	Learning outcomes / competences Students learn to apply practice-oriented finite element analysis software and to critically review their results. They can assess the relevance of the output and select and design them appropriately.							
3	Contents Basics and possibilities of the FEA, element types. Procedure for FEA applications, plausibility checks, output. Special features of FEA applications according to second theory order, load-bearing behaviour of slabs and walls. Applications of FEA in common construction practical systems, selected examples with the focus on critical result control.							
4	Participation requirements Knowledge and understanding of the methods from Statical Calculation 1 and 2							
5	Form of assessment Term paper and oral examination.							
6	Condition for the award of credit points Passed examination acc. to 5							
7	Application of the module (in the following study programmes): -							
8	Module coordinator Prof. Dr.-Ing. B. Wißmann							
9	Other information -							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Geotechnics 1 – Soil Mechanics								Abbr.
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	120 h	4	4th sem.	Annual	Summer	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	30 h	Lecture			German
	Sem. lessons		1 SCH / 15 h	15 h	Exercise		< 35	German
	Exercise							
	Practical		1 SCH / 15 h	15 h	Group work		8	German
2	Learning outcomes / competences							
	<p>Distinguish between the common soil types and the significant mechanical properties of the soils, knowledge of the investigation methods in the laboratory and in the field, mastering the stability verifications; Experience in teamwork in the laboratory practical; Experience in working independently with teaching media (script, textbooks, internet) when working through comprehension questions; Experience in optimising time management in exam preparation using sample exams</p>							
3	Contents							
	<p>Soil mechanics 1 and 2 Soil classification, plane seepage flow (associated laboratory tests), stress-strain behaviour of soils (associated laboratory tests), subsoil investigation, field tests, earth pressure and earth resistance, stability of shallow foundations, embankment failure</p>							
4	Participation requirements							
	Knowledge of hydromechanics, engineering mechanics, mathematics and building materials science.							
5	Form of assessment							
	Combination exam: Term paper and written exam or term paper and oral exam							
6	Condition for the award of credit points							
	Module examination pass							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Hans-Georg Gülzow							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Geotechnics 2 – Ground Engineering								Abbr.
No.	Workload	Credit points	Study semester	Frequency	Sem.	Duration	Type	Q level
	120 h	4	5th sem.	Annual	Winter	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	30 h	Lecture,		< 35	German
	Sem. lessons		2 SCH/30 h	30 h	exercise			German
	Exercise							
	Practical			h				
2	Learning outcomes / competences							
	<p>Knowledge of ground engineering constructions and procedures, mastery of calculation procedures, planning and designing ground engineering constructions, Identifying problems in ground engineering tasks and constructions, developing solutions for specific problems</p> <p>Experience in working independently with teaching media (script, textbooks, internet) when working through comprehension questions;</p> <p>Experience in optimising time management in exam preparation using sample exams</p>							
3	Contents							
	<p>Foundation engineering 1</p> <p>Excavations (retaining walls, anchorages, groundwater retention), retaining structures (gravity/angular retaining walls, reinforced earth), foundations (shallow and deep foundations, foundation slabs, piling systems), ground improvement (compaction, deep compaction, injections), geotextiles (fabrics, fleeces, geogrids)</p>							
4	Participation requirements							
	Knowledge of hydromechanics, engineering mechanics, mathematics, building materials and soil mechanics.							
5	Form of assessment							
	Written examination or oral examination							
6	Condition for the award of credit points							
	Module examination pass							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Hans-Georg Gülzow							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Advanced Studies in Geotechnics								Abbr.
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	5th sem.	Annual	Winter	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture Sem. lessons		2 SCH/30 h	45 h	Lecture			German
	Exercise Practical / Seminar		2 SCH/30 h	45 h	Exercise + group work	< 20		German
2	Learning outcomes / competences Knowledge of dam and dyke construction, in-depth knowledge of seepage flow, recognition of hazard situations for dams and dykes, calculation of potential distributions in seepage flows, handling of software tools, interpretation of calculation results Knowledge of special civil engineering, determination and use of characteristic values of bentonite suspensions, planning of the use of special civil engineering methods taking into account the given boundary conditions Knowledge of the raw materials and product forms of geosynthetics and their properties, planning the use of geosynthetic products for specific areas of application, providing proof of stability when using geosynthetic products							
3	Contents Sub-section 1 – Dam and dike construction Statics of earth dams, constructive elements, groundwater flow models, application of FEM for the calculation of seepage flow Sub-section 2 – Special civil engineering Special issues for deep excavations, diaphragm walls, pile foundations Sub-section 3 – Geosynthetics Raw materials, product forms, applications in hydraulic engineering, road construction and for reinforcement tasks							
4	Participation requirements Knowledge of Geotechnics							
5	Form of assessment Written examination or oral examination							
6	Condition for the award of credit points Module examination pass							
7	Application of the module (in the following study programmes): Civil Engineering (B.Eng.)							
8	Module coordinator Prof. Dr.-Ing. Hans-Georg Gülzow							
9	Other information The following parts of the module are offered by lecturers: Sub-section 2 – Special civil engineering Sub-section 3 – Geosynthetics							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Hydrology and Sewerage Systems 2								Abbr.
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	5th sem.	Annual	Winter	1 sem.	Compulsory elective	
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture Sem. lessons Exercise Practical / Seminar		2 SCH/30 h 2 SCH/ 30 h	45 h 45 h	Lecture Group work		 ≤ 15	German German
2	Learning outcomes / competences Planning, dimensioning, construction, operation and rehabilitation of the sewerage system (including special structures). Checking and evaluating the precipitation/runoff pattern in flowing waters and in waterlogged and water-saturated soil.							
3	Contents Hydrodynamic calculation model for sewer network calculation. Theory, application and result evaluation of the Hystem-Extran model in the computer room of the Laboratory for Building Informatics. Rehabilitation procedures and special structures of the sewerage system. Rainfall-runoff models, flood calculation and prediction, hydrological data acquisition and processing, water management, hydrogeological processes.							
4	Participation requirements None							
5	Form of assessment Term paper incl. presentation and written exam							
6	Condition for the award of credit points Successful completion of the examination							
7	Application of the module (in the following study programmes): Civil Engineering (B.Eng.) – Specialisation: Water Management, Geotechnical Engineering, Waste Management and Traffic Engineering (compulsory) – and Infrastructure Engineering (B.Eng.) (compulsory elective)							
8	Module coordinator Prof. Dr Johannes Weing							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Hydromechanics								Abbr. AK
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
1	150	5	2nd sem.	Annual	Summer	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	45 h	Lecture		≤ 35 / <8	German
	Sem. lessons		2 SCH/30 h	45 h	Exercise + Lab Pract.			German
	Exercise							
Practical / Seminar								
2	Learning outcomes / competences							
	<p>Participants develop an understanding of the basic physical units (mass, density, specific weight, viscosity, length, time, velocity, acceleration, pressure, work, energy and power). At the end of the module, students will be able to understand, evaluate and optimise hydrostatic, hydrodynamic systems in technical plants and in nature. They improve their teamwork skills and understanding through illustration and group work as part of the accompanying laboratory practical.</p>							
3	Contents							
	<p>Properties of water (forces, pressure, viscosity), hydrostatics, hydrodynamics (Reynolds number, continuity equation, Bernoulli's equation, momentum equation), water flows in pipes (roughness, energy head losses, pipeline characteristic, pump duty point, efficiency), open-channel flow (super-/subcritical flow, underflow, overflow, discharge for overfall spillways, basic equations for uniform flow, e.g. Manning-Strickler equation).</p>							
4	Participation requirements							
	None							
5	Form of assessment							
	Combination exam: Term paper and written exam							
6	Condition for the award of credit points							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Andreas Kahlfeld							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Maintenance, Repair and Overhaul in Built Environment								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	6th sem.	as required	Summer	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture Sem. lessons Exercise Practical / Seminar		2 SCH/30 h 2 SCH/30 h	45 h 45 h			≤ 20	German/ English German/ English
2	Learning outcomes / competences							
	Knowledge:							
	<ul style="list-style-type: none"> • This course aims to provide fundamental knowledge on the management, maintenance, repair and overhaul in facilities, constructions infrastructure systems and built environment. • This course includes practical training and field studies. • Projects • The course includes extended assignments based on realistic data sets supplied by the instructor. • Projects • The term project consists in the analysis and design of facilities; 							
3	Contents							
	Broad Objectives, students will learn							
	<ul style="list-style-type: none"> • Operation of facilities and infrastructure systems; • Life cycle and costs management; • Meaning and handling of maintenance, repair and overhaul of facilities; • about engineering standards and real constraints, including economic, environmental, social, political, and construction considerations; 							
	Learning outcomes, students							
	<ul style="list-style-type: none"> • Learn to estimate the manpower for maintenance, repair and overhaul for facilities and infrastructure systems; • Learn to estimate the costs for maintenance, repair and overhaul for facilities; • learn to estimate the meaning for the environment; 							
4	Participation requirements							
	<ul style="list-style-type: none"> • Ability to read and understand basic and detail engineering; • Ability to read and understand engineering drawings; • Ability to work in team settings; 							
5	Form of assessment							
	Term paper and written exam/ oral exam							
6	Condition for the award of credit points							
	Passing the term paper and the examination							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Johannes Weinig							
9	Other information							
	References and script cf. Ilias							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Design of Reinforced Concrete Structures								Abbr.
No.	Workload	Credit points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	5th sem.	Annual	Winter	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture Sem. lessons		2 SCH/30 h	45 h	Lecture		40	German
	Exercise Practical / Seminar		2 SCH/30 h	45 h	Sem. lessons		≤ 20	German
2	Learning outcomes / competences							
	<p>After successfully completing the module, students are able to</p> <ul style="list-style-type: none"> independently assess, design and pre-plan reinforced concrete structures, to carry out a static modelling of reinforced concrete structures and to pre-dimension components contained therein, identify advanced verification tasks in reinforced concrete construction and provide the associated verifications, independently prepare practical structural designs for an extended catalogue of structural elements of reinforced concrete construction, apply the extended catalogue of structural elements of reinforced concrete construction in a meaningful way and present them in construction drawings including reinforcement in a practical way. 							
3	Contents							
	<p>Reinforced concrete components and structural elements:</p> <ul style="list-style-type: none"> Beams and T-beams in reinforced concrete construction, Uniaxial and biaxial spanned slabs in reinforced concrete construction and flat slabs, Unreinforced and reinforced single foundations, Reinforced concrete walls. <p>Advanced design and verification procedures:</p> <ul style="list-style-type: none"> Extended verification for bending with longitudinal force, Fundamentals of verification for torsion without and with shear force, Design of single foundations and reinforced concrete walls, Verification of punching shear in floor slabs and foundations, Design and verification of bracing systems, Design of columns and compression members under the influence of deformation, Rational reinforcement and detailing in reinforced concrete construction, Computer-aided design and construction. 							
4	Participation requirements							
	<p>Formally, none. In terms of content, the knowledge of the module Design of Reinforced Concrete and Masonry Structures is assumed.</p>							
5	Form of assessment							
	Combination examination Term paper and written examination (term paper/written exam)							
6	Condition for the award of credit points							
	Module examination pass							
7	Use of the module (in the following degree programmes)							
	Civil Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Uwe Weitkemper							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Design of Reinforced Concrete and Masonry Structures								Abbr.
No.	Workload	Credit points	Study semester	Frequency	Sem.	Duration	Type	Q level
	300 h	10	3rd + 4th sem.	Annual	Winter	2 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture – Part 1		4 SCH/60 h	60 h	Lecture		60	German
	Lecture – Part 2		1 SCH /15 h	15 h	Lecture		60	German
	Exercise – Part 1		4 SCH/60 h	60 h	Sem. lessons		30	German
	Exercise – Part 2		1 SCH /15 h	15 h	Sem. lessons		30	German
2	Learning outcomes / competences							
	<p>After successfully completing the module, students are able to</p> <ul style="list-style-type: none"> Assess the advantages and disadvantages of solid construction compared to other construction methods, identify necessary verification tasks in reinforced concrete and masonry construction, Independently solve design tasks for simple reinforced in-situ concrete structures as well as common masonry structures and provide verifications, Apply construction elements of solid construction sensibly and represent them in construction plans according to the usual rules (for reinforced concrete components incl. reinforcement detailing). 							
3	Contents							
	<p>Sub-section 1: Concrete and reinforced concrete construction</p> <ul style="list-style-type: none"> Materials, safety concept and fundamentals of the load-bearing behaviour of reinforced concrete components Modelling and determination of internal forces for common reinforced concrete structures Checks in the ultimate limit states (ULS) due to bending, longitudinal force and shear force Verifications in the serviceability limit states (SLS) General principles of reinforcement detailing for reinforced concrete structural elements (uniaxially tensioned slabs, beams, columns) <p>Sub-section 2: Masonry construction</p> <ul style="list-style-type: none"> Materials of masonry construction and design variants of masonry constructions Static and building physics aspects during execution Standards and design rules for masonry construction Horizontal load transfer and spatial stability Calculations and verifications for common masonry constructions in building construction 							
4	Participation requirements							
	Formally, none. In terms of content, the knowledge of the module "Mechanics 2" is assumed.							
5	Form of assessment							
	Combination examination Term paper and written examination							
6	Condition for the award of credit points							
	Module examination pass							
7	Use of the module (in the following degree programmes)							
	Civil Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Uwe Weitkemper							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Maths Fitness								Abbr.
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	-	-	1st sem.	Annual	Winter	½ sem.	Elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		1 SCH	on demand	Lecture		35	German
	Exercises + Tutorials		1 SCH	on demand	Sem. lessons		35	German
2	Learning outcomes / competences							
	After successful completion of the module <ul style="list-style-type: none"> • students are able to apply the school subject matter of mathematics in engineering studies by reviewing it in the Maths Fitness module, • students are able to enter the module Mathematics 1 with the basic knowledge imparted, • students have strengthened their study skills in terms of self, methodological and social competences and refreshed their school knowledge. 							
3	Contents							
	Mathematics: <ul style="list-style-type: none"> • Numbers, basic rules for calculating with real numbers, • Fractions, percentages and powers, • Binomial formulae and quantities, • Solving equations, • Calculation and representation of linear and quadratic functions. 							
4	Participation requirements							
	Acceptance letter							
5	Form of assessment							
	No examination							
6	Condition for the award of credit points							
	-							
7	Application of the module (in the following study programmes):							
	This module can be used in all study programmes.							
8	Module coordinator							
	Prof. Dr.-Ing. K. Peters							
9	Other information							
	Introductory lecture with exercises of 2 SCH on a total of 5 days in the morning until the middle of the semester in a block.							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Mathematics 1								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	1st sem.	Annual	Winter	1 sem.	Compulsory	B
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	60 h	Lecture		≤ 35	German
	Sem. lessons		2 SCH/30 h	30 h	Exercise + independent work			German
	Exercise							
Practical / Seminar								
2	Learning outcomes / competences Application of the various mathematical methods to engineering problems, learning the associated mathematical and computational skills as the basic tools of the engineer.							
3	Contents Sets, functions, equations, inequalities, vector calculus, analytical geometry, matrix calculus, complex numbers, elementary functions.							
4	Participation requirements School mathematics, refresher course (fitness) of school mathematics before the beginning of the semester in the introductory period of the freshmen							
5	Form of assessment Written examination							
6	Condition for the award of credit points Passed written exam acc. to 5							
7	Application of the module (in the following study programmes): Knowledge of mathematics is a prerequisite for all subsequent subjects in Civil Engineering (B.Eng.)							
8	Module coordinator Prof. K. Peters							
9	Other information -							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Mathematics 2								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150	5	2nd sem.	Annual	Summer	1 sem.	Compulsory	B
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	60 h	Lecture		≤ 35	German
	Sem. lessons		2 SCH/30 h	30 h	Exercise + independent work			German
	Exercise							
	Practical / Seminar							
2	Learning outcomes / competences Application of the mathematical methods dealt with to engineering problems, learning the associated mathematical and computational skills as basic tools of the engineer.							
3	Contents Differential calculus, integral calculus, sequences and series, differential equations, eigenvalue problems, multiple integrals, statistics Examples of mathematical problems derived from engineering or physics.							
4	Participation requirements Mathematics 1							
5	Form of assessment Written examination							
6	Condition for the award of credit points Passed written exam acc. to 5							
7	Application of the module (in the following study programmes): Knowledge of mathematics is a prerequisite for all subsequent subjects in Civil Engineering (B.Eng.)							
8	Module coordinator Prof. K. Peters							
9	Other information -							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Mechanics 1								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	210 h	7	1st sem.	Annual	Winter	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture Sem. lessons		2 SCH/30 h	90h	Lecture			German
	Exercise Practical / Seminar		4 SCH/60 h	30	Exercise + independent work		≤ 35	German
2	Learning outcomes / competences Students learn to understand force systems, recognise symbols to represent static systems and assess complex static systems. You will be able to determine the moment and force diagrams of such systems under loads. They can determine the internal forces in trusses using various methods.							
3	Contents Loads, forces and force systems, static systems, bearings, joints, determining the degree of static indeterminacy, equilibrium, method of sections, moment and force diagrams, relationships between transverse load, shear force and bending moment diagrams, trusses.							
4	Participation requirements School knowledge in mathematics and physics							
5	Form of assessment Written examination							
6	Condition for the award of credit points Passed written exam acc. to 5							
7	Application of the module (in the following study programmes): Knowledge of Mechanics is a prerequisite for Mechanics 2, the subjects of Design of Reinforced Concrete Structures, Steel Construction, Masonry and Timber Construction and Statical Calculation of all specialisations.							
8	Module coordinator Prof. B. Wißmann							
9	Other information -							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Mechanics 2								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	210 h	7	2nd sem.	Annual	Summer	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	90 h	Lecture			German
	Sem. lessons		2 SCH/30 h	30 h	Lecture + indep. work		≤ 35	German
	Exercise		2 SCH/30 h		Exercise + indep. work		≤ 35	German
	Practical / Seminar							
2	Learning outcomes / competences							
	<p>Beam theory / beam statics: Understanding the relationships of the differential equations of the technical bending theory, applying the theoretical foundations. Understanding stability issues.</p> <p>Elastostatics: Acquiring the ability to calculate what dimensions the load-bearing elements of a structure must have. Assessment of the associated calculation methods with regard to their application limits.</p>							
3	Contents							
	<p>Beam theory / beam statics: Differential equations of engineering bending theory and applications, stability.</p> <p>Elastostatics: Stresses, strains, material law, beam theory, cross-section values, design for normal force, bending, shear force and torsion of thick- and thin-walled cross-sections.</p>							
4	Participation requirements							
	Knowledge of Mathematics 1 and Mechanics 1							
5	Form of assessment							
	Written examination							
6	Condition for the award of credit points							
	Passed written exam acc. to 5							
7	Application of the module (in the following study programmes):							
	Knowledge of Mechanics is a prerequisite for the subjects of Design of Reinforced Concrete Structures, Steel Construction, Masonry and Timber Construction and Statical Calculation of all specialisations.							
8	Module coordinator							
	Prof. K. Peters / Prof. B. Wißmann							
9	Other information							
	-							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Work-Related Project								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	240 h	8	4th/5th sem.	Annual	Summer	6 weeks	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)	Planned group size	Language	
	Lecture Sem. lessons Exercise Practical / Seminar Professional practice		in consultation	240 h	Presentation i.a. Professional activity	≤ 15	German German	
2	Learning outcomes / competences							
	On successful completion of the module, students have the following knowledge and skills: <ul style="list-style-type: none"> - They have applied the knowledge and skills acquired so far in their studies in an exemplary manner in practice and have deepened these. - They were introduced to professional practice and were able to get a realistic picture of a possible area of their future professional activity. - The work-related project provides further guidance in the choice of future professional activity. 							
3	Contents							
	<ul style="list-style-type: none"> - Practical work in a construction company, on the client side such as a public administration, in a planning office or in a consultancy firm. - Development of company-specific procedures, project organisation and project management, dealing with qualities, quantities, deadlines and costs, further development of social skills within the company - If applicable, independent work on smaller projects under guidance 							
4	Participation requirements							
	Knowledge in the subject modules of the first three semesters (see progress regulation according to SPO)							
5	Form of assessment							
	Combination examination (term paper and presentation)							
6	Condition for the award of credit points							
	Module examination pass							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.) with specialisation in Structural Engineering and Hydraulic Engineering							
8	Module coordinator							
	Prof. Dr.-Ing. Britta Wißmann (Structural Engineering) Prof. Dr.-Ing. Johannes Weinig (Water Management, Geotechnics, Waste Management and Traffic Engineering)							
9	Other information							
	<ul style="list-style-type: none"> - Duration of the practical training in the company at least 6 weeks / 30 working days - The company is chosen independently by the students 							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Practical Training: Construction Management								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	390 h	13	6th sem.	Annual	Summer	1 sem.	Compulsory	BA
1	Course type	Contact hours	Self-study	Forms of teaching (forms of learning)	Planned group size	Language		
	Lecture Sem. lessons Exercise Practical / Seminar Professional practice	0.2 SCH/stud.	30 h 360 h	Presentation and other professional activity	≤ 15	German German		
2	Learning outcomes / competences							
	<p>On successful completion of the module, students have the following knowledge and skills:</p> <ul style="list-style-type: none"> - They have applied the knowledge and skills acquired so far in their studies in an exemplary manner in practice and have deepened these. - They were introduced to professional practice and were able to get a realistic picture of a possible area of their future professional activity. - The work-related project provides further guidance in the choice of future professional activity. 							
3	Contents							
	<ul style="list-style-type: none"> - Practical work in a construction company, on the client side such as a public administration, in a planning office or in a consultancy firm. - Development of company-specific procedures, project organisation and project management, dealing with qualities, quantities, deadlines and costs, further development of social skills within the company - If applicable, independent work on smaller projects under guidance 							
4	Participation requirements							
	Knowledge in the subject modules of the first three semesters (see progress regulation according to SPO)							
5	Form of assessment							
	Project work							
6	Condition for the award of credit points							
	Module examination pass							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.) with specialisation in Construction Management							
8	Module coordinator							
	Prof. Dr.-Ing. Oliver Nister							
9	Other information							
	<ul style="list-style-type: none"> - Duration of the work term in the company at least 9 weeks / 45 working days - The company is chosen independently by the students 							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

2nd Language Module – Russian								Abbr.
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5		Annual	Winter	1 sem.	elective	BA
1	Type of course		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	45 h	Lecture		20	Russian / German
	Practical exercise		2 SCH/30 h	45 h	Practical exercises		20	Russian / German
2	Learning outcomes / competences At the end of the semester, students will be able to form and use simple sentences, ask and answer short questions in the area of language competences. You can understand simple sentences and communicate in situations involving familiar things, e.g. introduce yourself, ask about people, places, objects, names of countries, origin, nationality, etc. You can also talk about various activities, ask about them, have simple contact conversations, make short telephone calls. In the area of written competences, they have mastered the Cyrillic script. You are able to read simple texts and understand familiar vocabulary and topics.							
3	Contents <ul style="list-style-type: none"> • Cyrillic script. Pronunciation rules. Emphasis. Nouns, nominative singular Understanding internationalisms. Deciphering unknown words. Listening comprehension with W-questions • Gender. Endings. • Negation. • The absence of the corresponding forms for "is" and "are". • Personal pronoun. • Nouns. Case prepositional. Prepositions. Inquiring about the location. • Nouns. Accusative singular Asking to show something, giving. Say what you like/don't like. • Imperative verbs • Nouns. Generic singular Expressing ownership, belonging. • Negation of "have". • The verb. Conjugation endings. The negation. Fixed terms (of different activities). • И – conjugation, е – conjugation. • Irregular verbs. • Possessive pronoun. • Nouns on – И Я. Country names. • Stating name, age in the third person. • Preterite. Gender. • Adverbs. Sentence formation. • Vocabulary (introductions, forms of politeness, farewells. Like/dislike expressions, language skills, interests, activities). Possession, affiliation e.g. family, profession. 							
4	Participation requirements None							
5	Form of assessment Written exam							
6	Condition for the award of credit points Module examination pass							
7	Application of the module (in the following study programmes): Architecture (B.A.), Civil Engineering (B.Eng.), Project Management Construction (B.Eng.)							
8	Module coordinator Prof. Dr. Grit Behrens							
9	Other information Approx. 30% of the students speak Russian as their language of origin and have a command of the language at level B2-C1. This varies from course to course. Due to the lack of teaching hours, it is not possible to design differentiated lessons or to prepare differentiated exams.							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Water and Sanitation 1								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	4th sem.	Annual	Summer	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	45 h	Lecture		≤ 35	German
	Sem. lessons		2 SCH/30 h	45 h				German
	Exercise							
Practical / Seminar								
2	Learning outcomes / competences							
	Knowledge:							
	<ul style="list-style-type: none"> • Water extraction • Water supply, quality, demand, rainwater harvesting and water protection • Legal framework • Water demand assessment, water extraction, water pumping, water treatment, water storage, water distribution 							
	Sewage technology							
	<ul style="list-style-type: none"> • Types of waste water, waste water quantities and properties • Local drainage systems and structures 							
3	Contents							
	Skills:							
	<ul style="list-style-type: none"> • Developing concepts for the above-mentioned thematic areas • understand associated design principles and apply approximate design; • Plan and dimension water supply and wastewater engineering systems; 							
	Competence:							
	<ul style="list-style-type: none"> • Understanding of the interdisciplinary and ecological tasks of urban water management and its processes as a cornerstone of environmental engineering • Participation in the planning, construction and operation of water supply and wastewater technology facilities • coordinate services of general interest with the various interest groups 							
4	Participation requirements							
5	Form of assessment							
	Term paper and written exam							
6	Condition for the award of credit points							
	Passing the term paper and the examination							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.) and Infrastructure Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Johannes Weinig							
9	Other information							
	References and script cf. Ilias							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Water and Sanitation 2								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	5th sem.	Annual	Winter	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture Sem. lessons		2 SCH/30 h	45 h				German
	Exercise Practical / Seminar		2 SCH/30 h	45 h			≤ 20	German
2	Learning outcomes / competences							
	Knowledge:							
	<ul style="list-style-type: none"> • Dimensioning for water extraction • Dimensioning of drinking water treatment plants and supply networks; water storage, water distribution • Dimensioning of municipal waste water treatment plants in particular • Dimensioning of the activated sludge process and knowledge of other biological processes; • Design for stormwater management; • Dimensioning for sludge treatment and sewage sludge utilisation; 							
3	Contents							
	Skills:							
	<ul style="list-style-type: none"> • Developing concepts for the above-mentioned thematic areas • understand and be able to apply associated design rules • Be able to plan and dimension water supply and waste water technology systems 							
	Competence:							
	<ul style="list-style-type: none"> • Understanding of the interdisciplinary and ecological tasks of urban water management and its processes as a cornerstone of environmental engineering • Participation in the planning, construction and operation of water supply and wastewater technology facilities • Coordinate services of general interest with the various interest groups 							
4	Participation requirements							
5	Form of assessment							
	Term paper and written exam or term paper and oral exam							
6	Condition for the award of credit points							
	Passing the term paper and the examination							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Johannes Weinig							
9	Other information							
	References and script cf. Ilias							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Water and Sanitation 3								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	6th sem.	Annual	Summer	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture Sem. lessons		2 SCH/30 h	45 h				German
	Exercise Practical / Seminar		2 SCH/30 h	45 h			≤ 20	German
2	Learning outcomes / competences							
	Knowledge:							
	<ul style="list-style-type: none"> • Apply and measure water technology processes, in particular • Physical-chemical processes; • Thermal processes; • Biological methods; • make process choices from water analysis based on existing laws and understand the drivers of the processes; • combine different methods in a targeted manner; 							
3	Contents							
	Skills:							
	<ul style="list-style-type: none"> • Sizing and dimensioning of components of the different processes; Safe decision which process is target-oriented for the elimination or addition of elements; • Understand and be able to apply associated design rules 							
	Competence:							
	<ul style="list-style-type: none"> • Understanding of the interdisciplinary and ecological tasks of water technology and its processes as a cornerstone of environmental engineering • Participation in the planning, construction and operation of industrial water treatment plants 							
4	Participation requirements							
5	Form of assessment							
	Term paper and written exam or term paper and oral exam							
6	Condition for the award of credit points							
	Passing the term paper and the examination							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Johannes Weinig							
9	Other information							
	References and script cf. Ilias							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Prestressed and Precast Concrete Structures								Abbr.
No.	Workload	Credit points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	5th sem.	Annual	Summer	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture Sem. lessons		2 SCH/30 h	45 h	Lecture		≤ 20	German
Exercise Practical / Seminar		2 SCH/30 h		45 h	Sem. lessons			German
2	Learning outcomes / competences							
<p>After successfully completing the module, students are able to</p> <ul style="list-style-type: none"> • present and assess the special features, possible uses and application limits of prestressed concrete construction and precast concrete construction, • independently prepare practical structural designs for simple components of both construction methods, taking into account relevant construction conditions, • plan the handling of prestressed concrete components and precast elements on the construction site and critically analyse given assembly concepts, • develop in-depth knowledge of both construction methods independently and build up associated skills. 								
3	Contents							
<p>Prestressed concrete construction:</p> <ul style="list-style-type: none"> • Types of prestressing and post tensioning, associated application and prestressing force losses during prestressing • Assembly of tendons as well as internal forces and stresses due to prestressing • Loss of stressing forces due to time-dependent material behaviour and deformations • Fundamentals of verification in the limit states (SLS and ULS) • Keeping the stressing log and creating construction plans <p>Precast concrete construction:</p> <ul style="list-style-type: none"> • Types, uses, applications and assembly methods for precast concrete elements • Special features of load-bearing structures made of prefabricated elements and in semi-prefabricated construction and differences to in-situ concrete construction with regard to manufacture and verification • Bracing, bracing systems and spatial stability in precast concrete construction • Supports, connections and local detailing with associated verification tasks • Computer-aided design and construction of precast concrete structures 								
4	Participation requirements							
<p>Formally, none. In terms of content, the knowledge of the module "Design of Reinforced Concrete and Masonry Structures" is assumed.</p>								
5	Form of assessment							
<p>Combination examination Term paper and written examination</p>								
6	Condition for the award of credit points							
<p>Module examination pass</p>								
7	Use of the module (in the following degree programmes)							
<p>Civil Engineering (B.Eng.)</p>								
8	Module coordinator							
<p>Prof. Dr.-Ing. Uwe Weitkemper</p>								
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Steel Construction 1								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	3rd sem.	Annual	Winter	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	90 h	Lecture		≤ 35	German
	Sem. lessons		2 SCH/30 h		Independent work			German
	Exercise							
	Practical / Seminar							
2	Learning outcomes / competences							
	Assessing the possible uses of steel and steel structures from a design point of view, reading and understanding drawings. Design of tension bars, compression bars and bending beams. Design and verification of simple connections. Assessment of the stiffening of steel structures.							
3	Contents							
	Explanations on standardisation, material, corrosion protection, fire protection. Design of tension, compression and flexural beams. Design and construction of connections as bolted and welded joints. Guidance for independent expansion of the contents with the aid of standardisation and literature.							
4	Participation requirements							
	Knowledge of Mathematics 1 and Mathematics 2, Building Materials and Mechanics 1 and Mechanics 2							
5	Form of assessment							
	Term paper and written exam							
6	Condition for the award of credit points							
	Passed term paper with written exam acc. to 5							
7	Application of the module (in the following study programmes):							
	Knowledge of the fundamentals of Steel Construction is a prerequisite for Steel Construction 2 and the structural subjects of Hydraulic Engineering and Traffic Engineering as well as Bridge Construction							
8	Module coordinator							
	Prof. K. Peters							
9	Other information							
	-							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Steel Construction 2								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	5th sem.	Annual	Winter	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	90h	Lecture			German
	Sem. lessons							
	Exercise Practical / Seminar		2 SCH/30 h		Exercise + independent work		≤ 20	German
2	Learning outcomes / competences							
	Skill in the design and construction of steel structures of medium difficulty. Preparation of verifiable static calculations. Recognise special phenomena in steel construction relevant to design and calculation.							
3	Contents							
	2nd order theory, equilibrium on deformed system with design, fatigue, plastic design procedures, plate buckling, design for torsion, connections using prestressed bolts.							
4	Participation requirements							
	Steel Construction 1							
5	Form of assessment							
	Term paper and written exam							
6	Condition for the award of credit points							
	Passed term paper with written exam acc. to 5							
7	Application of the module (in the following study programmes):							
	Knowledge of the fundamentals of Steel Construction is a prerequisite for the constructive subjects of Integral Construction (M.A./M.Eng.)							
8	Module coordinator							
	Prof. K. Peters							
9	Other information							
	-							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Business Management								Abbr.
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	5th sem.	Annual	Winter	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h		Lecture			German
	Sem. lessons							
	Exercise		2 SCH/30 h	90			≤ 20	German
	Practical / Seminar							
2	Learning outcomes / competences							
	The module Business Management teaches the basic knowledge of managing a company. Here, building on the lectures and exercises, students should develop and consolidate their own skills and abilities in the structural organisation of a company. Upon completion of the module, the students know the interdependencies of the individual company divisions and can differentiate their areas of expertise.							
3	Contents							
	The content of the module is the teaching of the subject areas: Company foundation, company goals, company organisation and forms, personnel management, conflict resolution strategies, public relations and accounting. In addition to the lectures, exercises on the above-mentioned topics are offered, which enable the practical application of the different topics.							
4	Participation requirements							
	None							
5	Form of assessment							
	Term paper or written exam							
6	Condition for the award of credit points							
	Successful completion of the term paper or passed written examination							
7	Application of the module (in the following study programmes):							
	Compulsory module in Project Management Construction (B.Eng.), compulsory elective module in Civil Engineering (B.Eng.)/Construction Management							
8	Module coordinator							
	Prof. Dr.-Ing. Matthias Kathmann							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Traffic Engineering 1								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	5th sem.	Bi-annual	Winter	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	45 h	Lecture		60	German
	Sem. lessons						35	
	Exercise Practical / Seminar		2 SCH/30 h	45 h	Calculations		30 15	German
2	Learning outcomes / competences							
	<p>Knowledge of the basics of traffic engineering and its regulations Understanding the theories and models for the realisation concepts Apply the fundamentals in their contexts to achieve unity in the planning, design, construction and operation of transport facilities Analysing the dependencies between driver, vehicle and route Assess the effects of transport facilities on safety, economic efficiency and the environment</p>							
3	Contents							
	<p>Fundamentals of road and rail transport:</p> <ul style="list-style-type: none"> • Traffic planning –basics, methodology, survey, assessment, analysis and forecast, network design, regulations and guidelines • Design with its elements in layout plan, longitudinal plan and cross-section • Design of spaces for all traffic participants • Three-dimensional design for earthwork, road and track construction with quantity assessment • Operation of road and rail traffic, traffic control, traffic signals, rail safety 							
4	Participation requirements							
	None							
5	Form of assessment							
	Term paper and written exam							
6	Condition for the award of credit points							
	Module examination pass							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.) and Infrastructure Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Andreas Kahlfeld							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Traffic Engineering 2								Abbr. GME
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	6th sem.	Annual	Summer	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	45 h	Lecture		60	German
	Classes						35	
	Exercise		2 SCH/30 h	45 h	Calculations		30	German
	Practical / Seminar						15	
2	Learning outcomes / competences							
	<p>Knowledge of the innovations in transport construction for current demands Understanding of the new digital theories and models Apply the interdependencies of Car2Car and Car2Infrastructure approaches Analyse the interdependencies of multimodal mobility systems Evaluate the effects of traffic information on the overall network</p>							
3	Contents							
	<p>Special disciplines of road and rail transport in transport planning, re-design of transportation – networks in cities Design of special facilities (e.g. border facilities, event areas, car parks, freight distribution hubs) Special requirements for earthworks, road and track construction (tunnels, pedestrian zones, high-speed lines) Operation of road and rail traffic via modern facilities for traffic and mobility management</p>							
4	Participation requirements							
	None							
5	Form of assessment							
	Oral examination or written exam							
6	Condition for the award of credit points							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.) and Infrastructure Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Andreas Kahlfeld							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Land Surveying BBW								Abbr.
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	1st sem.	Annual	Winter	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		1 SCH / 15 h	25 h	Lecture			German
	Sem. lessons							
	Exercise							
	Practical / Seminar		3 SCH / 45 h	65 h	Practical		5	German
2	Learning outcomes / competences							
	<p>After successfully completing the module, students are able to</p> <ul style="list-style-type: none"> describe different methods of height determination and their possible applications, carry out and evaluate a hydrostatic, geometric and trigonometric levelling, derive a profile representation from a terrain survey using a GNSS system and a correction data service, describe and execute different methods and tools of position measurement and their possible applications, measure an object in a local and in a superordinate coordinate system and represent it in a map, carry out a building survey as a manual survey and as a tacheometric survey, calculate stakeout data from coordinates and transfer them orthogonally and polar to the terrain, perform basic geodetic calculations (coordinates, areas and volumes). 							
3	Contents							
	<ul style="list-style-type: none"> Mathematical and geodetic basics Geodetic instruments for height and position measurement and their handling Structure and function of machine controls Geodetic calculations, longitudinal and transverse profiles, routing elements Building survey methods 							
4	Participation requirements							
	None							
5	Form of assessment							
	Combination exam: Term paper and written exam or term paper and oral exam							
6	Condition for the award of credit points							
	Proven participation in the practicals, passing the module examination							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Weitkemper							
9	Other information							
	The courses are taught by Dipl.-Ing. Andreas Nobbe.							

**Module catalogue for the bachelor's degree study programme in
Civil Engineering**

Hydraulic Structures 2								Abbr. AK
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	5th sem.	Annual	Winter	1 sem.	Compulsory elective	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture Sem. lessons Exercise Practical / Seminar		4 SCH/60 h	90 h	Lecture, exercise, excursion		≤ 35	German
2	Learning outcomes / competences							
	Imparting knowledge and understanding of <ul style="list-style-type: none"> • the natural processes in coastal waters / on coasts which are relevant to hydraulic engineering • the special character of the hydrodynamic forces and vibrations on coastal structures, <ul style="list-style-type: none"> (a) their dependencies on the probability of occurrence of extreme events and (b) their correct selection and combination for the design Imparting knowledge about stresses and design methods, building and construction forms as well as construction processes Imparting knowledge about the course of planning processes and approval procedures							
3	Contents							
	<ul style="list-style-type: none"> • Natural basics and environmental conditions at sea and on coasts • Field measurements and availability of data • Determination of actions for structural design • Design of structures (sea dikes, breakwaters and piers as well as offshore wind turbines) against high water and swell as well as ship-induced loads on quay structures • Processes of coastal sediment transport and construction measures to protect sandy coasts • Handling facilities in seaports • Expansion of port accesses in tidal rivers and environmental consequences • River and coastal engineering models • Approval procedure 							
4	Participation requirements							
	Knowledge of fluid mechanics or hydromechanics							
5	Form of assessment							
	Combination exam: Term paper and written exam							
6	Condition for the award of credit points							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.), Infrastructure Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Andreas Kahlfeld							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Hydraulic Structures and Hydrology 1								Abbr. AK
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	4th sem.	Annual	Summer	1 sem.	Compulsory	BA
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture		2 SCH/30 h	45 h	Lecture			German
	Sem. lessons		2 SCH/30 h	45 h	Exercise + Lab Pract.		≤ 35 / ≤ 8	German
	Exercise							
	Practical / Seminar							
2	Learning outcomes / competences							
	In the course of the course, the participants acquire basic engineering knowledge about hydrology as a basis for planning, the phenomena of water bodies as well as the structures and construction methods of structural hydraulic engineering.							
3	Contents							
	Hydraulic engineering: Inland rivers, dams, artificial waterways, tides and tidal rivers, coasts and seas, watercourse development and maintenance, associated structures and construction methods Hydrology: Water cycle and water balance, main hydrological parameters, hydrology as a basis for water management and water engineering planning, hydrology, catchment area survey, precipitation-runoff process, flood generation and occurrence, hydrological yearbook							
4	Participation requirements							
	Knowledge of fluid mechanics or hydromechanics							
5	Form of assessment							
	Combination exam: Term paper and written exam							
6	Condition for the award of credit points							
7	Application of the module (in the following study programmes):							
	Civil Engineering (B.Eng.), Infrastructure Engineering (B.Eng.)							
8	Module coordinator							
	Prof. Dr.-Ing. Andreas Kahlfeld							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Water and Soil Analysis								Abbr.
No.	Workload	Credit Points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	4th sem.	Annual	Summer	1 sem.	Compulsory	
1	Course type		Contact hours	Self-study	Forms of teaching (forms of learning)		Planned group size	Language
	Lecture Sem. lessons Exercise		2 SCH/30 h	45 h	Lecture			German
	Practical / Seminar		2 SCH/ 30 h	45 h	Group work		≤ 15	German
2	Learning outcomes / competences Knowledge of relevant environmental chemicals in the media water, soil and waste with the associated analytical possibilities. Evaluation of the results and consequences for the further use/treatment of the medium within the framework of environmental law.							
3	Contents Basics of theoretical and practical analytics. Chemical, physical, biological and organoleptic parameters of water, wastewater and soil. The organic load and its sum parameters. The carbon, phosphorus and nitrogen cycle. The eutrophication of water bodies, the behaviour and analysis of heavy metals, HCFCs, individual organic compounds. Assessment of the parameters depending on the use. Practical analytical work in the laboratory and seminar-based examination and assessment of the results of water samples from the region.							
4	Participation requirements None							
5	Form of assessment Term paper incl. presentation and written exam							
6	Condition for the award of credit points Successful completion of the examination							
7	Application of the module (in the following study programmes): Civil Engineering (B.Eng.) – Specialisation: Water Management, Geotechnics, Waste Management and Traffic Engineering (compulsory)							
8	Module coordinator Prof. Dr Johannes Weinig							
9	Other information							

**Module catalogue for the bachelor's degree study programme in Civil Engineering
of the Faculty of Minden Campus**

Building Ecology and Sustainability								Abbr.
No.	Workload	Credit points	Study semester	Frequency	Sem.	Duration	Type	Q level
	150 h	5	3rd–6th sem.	Annual	Summer	1 sem.	Compulsory elective	
1	Course type		Contact hours	Self-study	Teaching forms (learning methods)		Planned group size	Language
	Seminar		2 SCH				25	
	Exercises / Lab / Building		2 SCH	90 h	Group work		approx. 10–25	German
2	Learning outcomes/competences							
	In this module, students gain fundamental knowledge on “Building ecology” and “Sustainability in construction”. Building upon the lectures and exercises, students will develop and enhance their own skills and proficiency in this area. On completion of the module, students will be able to differentiate between the various harmful substances that may develop during the construction, conversion or dismantling of a building and to plan effective remedial or protective actions or to advise clients on this. Furthermore, they are able to determine the different periods of a building’s life cycle and to describe the impact on the ecosystem resulting from these periods.							
3	Contents							
	In terms of content, the module “Building Ecology and Sustainability” focuses on: <ul style="list-style-type: none"> • Construction products and their substances • Building inventory focusing on harmful substances (Project work – Building stock) • Impact of harmful substances on health and the ecosystem • Guidelines for renovation concepts • Life-cycle concepts (“Cradle to Grave” and “Cradle to Cradle”) • Evaluation and system boundaries in the life cycle of buildings (ecological, economic, socio-cultural, functional and technical quality) • Fundamentals of environmental accounting 							
4	Participation requirements							
	Formal: none							
5	Form of assessment							
	Project work / Building inventory focusing on possible harmful substances / Analysis and evaluation of harmful substances / Report writing and presentation of results							
6	Condition for the award of credit points							
	Module examination pass							
7	Application of the module (in the following study programmes):							
	Compulsory elective module in Civil Engineering (B.Eng.) and Project Management Construction (B.Eng.)							
8	Module coordinator							
	Prof. Dr. Matthias Kathmann							
9	Other information							