

**Annex 1:**  
**Module descriptions**

**DISCLAIMER:** Please note that the English translation is provided for information purposes only. The English text is not legally binding. Only the original German document has legal validity. The official language at TU Dresden is German. German jurisdiction applies.

Note: SWS = The semester hours per week (SWS) indicate the duration of the courses in a semester. 1 SWS means that the course lasts one hour (1 x 45 minutes) per week in the respective semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-PFL 10	Operations Research and Logistics	Prof. Jörn Schönberger (joern.schoenberger@tu-dresden.de)
<b>Qualification aim</b>	The students know a variety of methods and models that can be used to solve diverse optimization problems. Furthermore, students are able to use optimization software to solve complex problems.	
<b>Content</b>	The content of the module includes the design and planning of transportation networks, transportation planning and program design, basic models of vehicle deployment planning, integrated planning of self-routing and subcontracting, and the design of freight rates.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	Basic undergraduate level knowledge of operations research is presupposed. The following literature is suitable for preparation: Ivanov, D.; Tsipoulanidis, A.; Schönberger, J.: Global Supply Chain and Operations Management - A Decision-Oriented Introduction to the Creation of Value, newest edition.	
<b>Usability</b>	The module is a compulsory module in the master's program Transportation Economics. It provides the prerequisite for the modules Decision Support in Transportation Logistics, Management of Public Transport Systems and Services, and Vocational Internship.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of homework and practice assignments in the extent of 75 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 11	Decision Support in Transportation Logistics	Prof. Jörn Schönberger (joern.schoenberger@tu-dresden.de)
<b>Qualification aim</b>	The students know the design concepts of algebraic search methods for decision problems. Furthermore, they understand the conception and realization of modern search methods of artificial intelligence (evolutionary and genetic search, local search, ant algorithms, etc.) and are able to design and implement prototypical search methods for selected decision problems from (transport) logistics. The students are able to work on complex, practical decision problems by applying search procedures and derive concrete proposals for action. They possess in-depth skills in the use of software and programming languages (media competence). Furthermore, the students are strengthened in their personality.	
<b>Content</b>	In logistics, many complicated and interrelated decision problems arise in connection with the conception, planning and execution of transports (of persons and goods). These problems can be represented (modeled) in an algebraically compact way. However, solving these models using standard solution methods ("black-box solvers") is not possible because either the necessary structural model properties are not available or the available solution time is not sufficient. In such a situation, the design and implementation of so-called problem-specific heuristics has to be considered. This will be discussed with reference to current research.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	The competencies to be acquired in the Operations Research and Logistics module are required. Bachelor level knowledge in a higher programming language (ideally C++) is expected. The following literature is suitable for preparation: Stroustrup, B.: Programming: Principles and Practice Using C++, Addison Wesley, newest edition.	
<b>Usability</b>	The module is a compulsory elective module of the specialization Computational Logistics of the module group Specializations in the Master's program Transportation Economics, of which two out of five have to be chosen. It provides the prerequisite for the module Research Task in Computational Logistics. Furthermore, the module is a compulsory elective module in the area of Transportation Economics of the module group Supplements in the Master's program Transportation Economics, of which modules amounting to 30 credit points must be selected. The module cannot be taken if it has already been selected in the module group Specializations.	

<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a project work in the extent of 75 hours.
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 12	Management of Public Transport Systems and Services	Prof. Jörn Schönberger (joern.schoenberger@tu-dresden.de)
<b>Qualification aim</b>	Students are familiar with the decision problems that arise in the context of the design, configuration and operation of passenger transportation systems. They have an insight into the algebraic modeling of these decision situations and can apply techniques and tools with which the complex models can be solved. Students are able to select and apply the modeling and decision-making techniques they have learned in a goal-oriented manner. Furthermore, the students are strengthened in their personality.	
<b>Content</b>	Content of the module is the planning of infrastructure, especially the definition of line routes. Other content includes timetabling, planning of staff deployment based on the defined service provision processes, specification of the public transport products offered, and an overview of challenges arising from the operating concepts for shared mobility systems. The content is based on the current state of research.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	The competencies to be acquired in the Operations Research and Logistics module are required, as well as basic knowledge at bachelor level of programming (e.g. VBA, PHP, Java, C++), as taught, for example, in the Bachelor's degree program in Verkehrswirtschaft in the module Programmierung. The following literature is suitable for preparation: Stroustrup, B.: Programming: Principles and Practice Using C++, Addison Wesley, newest edition.	
<b>Usability</b>	The module is a compulsory elective module of the specialization Computational Logistics of the module group Specializations in the Master's program Transportation Economics, of which two out of five have to be chosen. It creates the prerequisite for the module Research Task in Computational Logistics. Furthermore, the module is a compulsory elective module in the area of Transportation Economics of the module group Supplements in the Master's program Transportation Economics, of which modules amounting to 30 credit points must be chosen. The module cannot be taken if it has already been selected in the module group Specializations.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a project work in the extent of 75 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	

<b>Frequency of module</b>	The module is offered each academic year in the summer semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 13	Research Task in Computational Logistics	Prof. Jörn Schönberger (joern.schoenberger@tu-dresden.de)
<b>Qualification aim</b>	Students are able to independently understand, interpret and explain optimization problems in transport economics and logistics. They can critically evaluate and implement solution approaches. They have key qualifications in the area of rhetoric, presentation and presentation techniques. Furthermore, the students are strengthened in their personality.	
<b>Content</b>	The content of the module is scientific, current issues in traffic management, the application of quantitative methods to selected system and process planning scenarios in traffic and logistics companies as well as the preparation of literature reviews on concretely defined research areas.	
<b>Teaching and learning methods</b>	2 SWS seminar and independent study.	
<b>Requirements for participation</b>	The competencies to be acquired in the Decision Support in Transportation Logistics and Management of Public Transport Systems and Services modules are required. Prerequisite for participation in the module according to § 25 paragraph 2 Examination Regulations are the previously passed modules Decision Support in Transportation Logistics and Management of Public Transport Systems and Services.	
<b>Usability</b>	The module is a compulsory elective module of the module group Research Papers in the Master's program Transportation Economics, of which one out of five has to be chosen.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion of the results in the extent of 400 hours.	
<b>Credit points and grades</b>	15 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 450 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-PFL 20	Methods in Transport Policy	Dr. Stefan Tucharaktschiew (stefan.tucharaktschiew@tu-dresden.de)
<b>Qualification aim</b>	The students have knowledge of economic and econometric methods, which enable them to understand empirical studies on transport policy issues and to interpret their results. In addition, they are able to implement these methods in practice and to recognize and solve problems that arise in the process. They possess key qualifications in the areas of social competence, teamwork and media competence. The acquired methodological competencies enable the students to assess the overall social relevance of (empirical) transport policy issues, which strengthens their ability to act in a socially responsible manner. Furthermore, the students are strengthened in their personality.	
<b>Content</b>	The content of the module is basic and advanced economic and econometric methods applied in the analysis of transport policy issues; also using econometric software. The methods used are based on the current state of research.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	Knowledge of microeconomics and statistics at the undergraduate level is required. The following literature is suitable for preparation: Varian, Hal R.: Intermediate Microeconomics: A modern Approach, Norton, New York, newest edition; Heumann, C., Schomaker Shalab, M.: Introduction to Statistics and Data Analysis, Springer, 2016.	
<b>Usability</b>	The module is a compulsory module in the master's program Transportation Economics. It provides the prerequisite for the modules Module Cost-Benefit Analysis in Transport, Cost and Prices in Transport and Vocational Internship.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a project work in the extent of 75 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 21	Cost-Benefit Analysis in Transport	Dr. Stefan Tscharaktschiew (stefan.tscharaktschiew@tu-dresden.de)
<b>Qualification aim</b>	The students are able to present the economic theory of the welfare-based assessment of transport projects, including the multitude of cost and benefit components, and to comprehend these on the basis of practical examples. This enables students to systematically and theoretically analyze socio-politically relevant issues beyond the field of transport, thus strengthening their ability to make decisions and act responsibly for society as a whole.	
<b>Content</b>	The content of the module is an in-depth presentation of the possibilities of measuring and evaluating costs and benefits as well as the associated problems and difficulties. Furthermore, the module deals with the question of how measurement and evaluation of costs and benefits change when central framework conditions in the transport sector change. Current research results in transport economics are part of the module as well as basic approaches to the formalization of analyses.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	The competencies to be acquired in the Methods in Transport Policy module are required.	
<b>Usability</b>	The module is a compulsory elective module of the specialization Transport Policy of the module group Specializations in the Master's program Transportation Economics, of which two out of five have to be chosen. It provides the prerequisite for the module Research Task in Transport Policy. Furthermore, the module is a compulsory elective module in the area of Transportation Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points must be chosen. The module cannot be taken if it has already been chosen in the module group Specializations.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 120 minutes duration.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	

<b>Duration of the module</b>	The module lasts one semester.
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<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 22	Cost and Prices in Transport	Dr. Stefan Tscharaktschiew (stefan.tscharaktschiew@tu-dresden.de)
<b>Qualification aim</b>	Students will be familiar with the relationship between costs and prices in the transport sector and will be able to assess the typical regulation of transport companies in terms of its appropriateness. Students will be able to identify existing (or future) inefficiencies in various areas of the transport sector and develop suitable solutions to eliminate them. The students have knowledge of the welfare-optimized pricing of transport services (individual transport, local public transport) as well as the pricing of transport infrastructure facilities. Based on this comprehensive knowledge, students have the ability to act in a socially responsible manner by being able to recognize, develop and communicate approaches to solutions for improving the overall social situation in the transport sector.	
<b>Content</b>	The contents of the module are both analytical and quantitative methods that are required for the analysis of a variety of transport economic and transport policy issues in the areas of individual passenger road transport, local public transport as well as air transport. This will be discussed with relation to current research.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	The competencies to be acquired in the Methods in Transport Policy module are required.	
<b>Usability</b>	The module is a compulsory elective module of the specialization Transport Policy of the module group Specializations in the Master's program Transportation Economics, of which two out of five have to be chosen. It provides the prerequisite for the module Research Task in Transport Policy. Furthermore, the module is a compulsory elective module in the area of Transportation Economics of the module group Supplements in the Master's program Transportation Economics, of which modules amounting to 30 credit points must be chosen. The module cannot be taken if it has already been selected in the module group Specializations.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 120 minutes duration.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	

<b>Duration of the module</b>	The module lasts one semester.
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<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 23	Research Task in Transport Policy	Dr. Stefan Tscharaktschiew (stefan.tscharaktschiew@tu-dresden.de)
<b>Qualification aim</b>	The students are able to perform advanced scientific work in close cooperation with the chair on its current research topics. They are familiar with the handling of scientific literature as well as the independent work on concrete research questions of the chair. The intensive study of issues relevant to society as a whole encourages the students' ability to act in a socially responsible manner. The students have key qualifications in the areas of rhetoric, presentation and presentation techniques. Furthermore, the students are strengthened in their personality.	
<b>Content</b>	The content of the module is the current research focus of the chair in the field of transport policy and transport economics, for example topics such as optimal congestion charging, optimal emission tax, cost-benefit analysis, of infrastructure investments or the discrete choice analysis of mobility-related decisions.	
<b>Teaching and learning methods</b>	2 SWS seminar and independent study.	
<b>Requirements for participation</b>	The competencies to be acquired in the modules Cost-Benefit Analysis in Transport and Cost and Prices in Transport are required. Prerequisite for participation in the module according to § 25 paragraph 2 Examination Regulations are the previously passed modules Cost-Benefit Analysis in Transport and Cost and Prices in Transport.	
<b>Usability</b>	The module is a compulsory elective module of the module group Research Papers in the Master's program Transportation Economics, of which one out of five has to be chosen.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion of the results in the extent of 400 hours.	
<b>Credit points and grades</b>	15 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 450 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-PFL 30	Spatial Economics and the Environment	Prof. Dr. Georg Hirte (georg.hirte@tu-dresden.de)
<b>Qualification aim</b>	Students have a solid understanding of the microeconomic structure of spatial economic models including mobility and external effects as well as the essential models of New Economic Geography. They have the ability to theoretically and numerically analyze essential regional, transport and environmental economic issues within the framework of these approaches. Thus, students are able to assess socially relevant problems with a spatial-economic context and to decide and act accordingly in a responsible manner for society as a whole. Students have key qualifications in the areas of rhetoric, presentation and presentation techniques as well as social competence and teamwork. Furthermore, the students are strengthened in their personality. They have basic skills in the use of mathematical modeling software.	
<b>Content</b>	The content of the module is an introduction to the microeconomic foundations of spatial economics with reference to the topics of transport, environment and agglomeration. Among other things, the modeling of commuting and location decisions as well as of external effects is dealt with. Taking into account the approach of the New Economic Geography, political options for action with spatial relevance are discussed. The modeling of complex interregional relationships is carried out within the framework of general equilibrium models using a software-based algebraic modeling language for mathematical optimization. The content is based on current research results in regional economics.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	Knowledge of microeconomics and statistics at the undergraduate level is required. The following literature is suitable for preparation: Varian, Hal R.: Intermediate; Microeconomics: A modern Approach, Norton, New York, newest edition.	
<b>Usability</b>	The module is a compulsory module in the master's program Transportation Economics. It provides the prerequisite for the modules Empirical Research in Spatial and Environmental Economics und Urban Economics, and Vocational Internship.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a project work in the extent of 75 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	

<b>Frequency of module</b>	The module is offered each academic year in the winter semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 31	Empirical Research in Spatial and Environmental Economics	Prof. Dr. Georg Hirte (georg.hirte@tu-dresden.de)
<b>Qualification aim</b>	Students have advanced knowledge of the methods of empirical regional and environmental economic research and are able to apply them. The students have key qualifications in the areas of rhetoric, presentation and presentation techniques as well as social competence and teamwork. Furthermore, the students are strengthened in their personality.	
<b>Content</b>	The content of the module is the basics of regression analysis as well as the presentation of methods of spatial economics specifically used in regional research. Using software and concrete regional data, individual questions are examined using various methods with reference to current research.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	The competencies to be acquired in the module Spatial Economics and the Environment as well as basic statistical knowledge at the bachelor's level are required. For preparation serves for example: Heumann, C., Schomaker Shalab, M.: Introduction to Statistics and Data Analysis, Springer, 2016.	
<b>Usability</b>	The module is a compulsory elective module of the specialization Spatial and Environmental Economics of the module group Specializations in the Master's program Transportation Economics, of which two out of five have to be chosen. It provides the prerequisite for the module Research Task in Spatial and Environmental Economics. Furthermore, the module is a compulsory elective module in the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points have to be chosen. The module cannot be taken if it has already been selected in the module group Specializations.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a project work in the extent of 75 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	

<b>Duration of the module</b>	The module lasts one semester.
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<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 32	Urban Economics	Prof. Dr. Georg Hirte (georg.hirte@tu-dresden.de)
<b>Qualification aim</b>	Students have a solid understanding of the main approaches and problems of urban economics. They have the ability to numerically investigate and analyze urban economic issues within the framework of these approaches. Students have key skills in the areas of rhetoric, presentation and presentation techniques, as well as social skills and teamwork. The acquired knowledge promotes the students' ability to act in a socially responsible manner by being able to classify possible urban economic measures in a scientifically sound manner and to evaluate them with regard to their possible contribution to the improvement of the overall social situation. Furthermore, the students are strengthened in their personality.	
<b>Content</b>	The content of the module is the theoretical foundations of urban economics as well as the analysis of the effects of policy measures in the urban environment. The focus is on housing and land use regulation, transport in urban areas, agglomeration effects, external effects caused by emissions, environmental effects, as well as urban economic issues in the context of developing countries. These socially relevant issues are addressed in a scientific context with research relevance.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	The competencies to be acquired in the module Spatial Economics and the Environment are required.	
<b>Usability</b>	The module is a compulsory elective module of the specialization Spatial and Environmental Economics of the module group Specializations in the Master's program Transportation Economics, of which two out of five have to be chosen. It provides the prerequisite for the module Research Task in Spatial and Environmental Economics. Furthermore, the module is a compulsory elective module in the field of Transportation Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points have to be chosen. The module cannot be taken if it has already been chosen in the module group Specializations.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a project work in the extent of 75 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	

<b>Frequency of module</b>	The module is offered each academic year in the summer semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 33	Research Task in Spatial and Environmental Economics	Prof. Dr. Georg Hirte (georg.hirte@tu-dresden.de)
<b>Qualification aim</b>	The students have a distinct understanding of spatial economic and environmental economic approaches and methods. In particular, they are able to work independently on scientifically relevant issues, to present, discuss and assess scientific research results in a sophisticated manner and to prepare scientific research papers in a qualified manner. They have key qualifications in rhetoric, presentation and presentation techniques. The intensive study of scientifically and socially relevant issues also enables students to act in a socially responsible manner. Furthermore, the students are strengthened in their personality.	
<b>Content</b>	The content of the module is the independent processing, discussion and presentation of scientifically relevant questions in the fields of regional, environmental and urban economics, such as the empirical or numerical analysis of the spatial effects and welfare impact of public investments, regulatory interventions in the housing market or natural disasters.	
<b>Teaching and learning methods</b>	2 SWS seminar and independent study.	
<b>Requirements for participation</b>	The competencies to be acquired in the modules Empirical Research in Spatial and Environmental Economics and Urban Economics are required. Prerequisite for participation in the module according to § 25 paragraph 2 Examination Regulations are the previously passed modules Empirical Research in Spatial and Environmental Economics and Urban Economics.	
<b>Usability</b>	The module is a compulsory elective module of the module group Research Work in the Master's program Transportation Economics, of which one out of five has to be chosen.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion of the results in the extent of 400 hours.	
<b>Credit points and grades</b>	15 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 450 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-PFL 40	Theoretical Multivariate Statistics	Prof. Dr. Ostap Okhrin (ostap.okhrin@tu-dresden.de)
<b>Qualification aim</b>	Students will be able to apply procedures that are commonly used in the reality describing multivariate data. Students are familiar with the following topics and methods: matrix algebra, regression analysis, simple analysis of variance, general and specific multivariate distributions, copulas, theory of multivariate normal distribution, estimation theory, hypothesis testing. Furthermore, students acquire mathematical and statistical foundations to understand other procedures such as cluster analysis, principal component analysis and other methods.	
<b>Content</b>	The content of the module are procedures of theoretical multivariate statistics and their methods of analysis.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	Bachelor's level knowledge of mathematics and statistics is required. The following literature is suitable for preparation: Sydsaeter, K.; Hammond, P.: Essential Mathematics for Economic Analysis, Financial Times Prentice Hall, Harlow, newest edition. Härdle, W., Okhrin, O., Okhrin, Y.: Basic Elements of Computational Statistics, Springer, 2017.	
<b>Usability</b>	The module is a compulsory module in the master's program Transportation Economics. It provides the prerequisite for the modules Applied Multivariate Statistics, Data-Driven Multivariate Statistics, and Vocational Internship.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 120 minutes duration.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 41	Applied Multivariate Statistics	Prof. Dr. Ostap Okhrin (ostap.okhrin@tu-dresden.de)
<b>Qualification aim</b>	Students know the most important multivariate statistical methods, such as cluster analysis, regression analysis, analysis of variance, discriminant analysis and factor analysis, and apply them to real data. They also have key skills in the areas of rhetoric, presentation and presentation techniques and possess social skills and the ability to work in a team.	
<b>Content</b>	The content of the module is the application of multivariate statistical methods to specific problems and the introduction to a free programming language for statistical calculations and graphics. The content is treated with reference to current research.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	The competencies to be acquired in the module Theoretical Multivariate Statistics are required.	
<b>Usability</b>	The module is a compulsory elective module of the specialization Statistics of the module group Specializations in the Master's program Transportation Economics, of which two out of five have to be chosen. It provides the prerequisite for the module Research Task in Statistics. Furthermore, the module is a compulsory elective module in the area of Transportation Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points must be chosen. The module cannot be taken if it has already been chosen in the module group Specializations.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a project work in the extent of 75 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 42a	Data-Driven Multivariate Statistics	Prof. Dr. Ostap Okhrin (ostap.okhrin@tu-dresden.de)
<b>Qualification aim</b>	Students have an in-depth understanding of data analysis, especially of unstructured data and of handling data sets with missing data. They have strong skills in using statistical software (media literacy).	
<b>Content</b>	Content of the module are non-trivial regressions (with correlated residuals, non-diagonal covariance matrices, kernel regressions etc.), Bayesian regressions, classification methods (logistic regressions, support vector machines, decision trees, random forests, boosting, bagging etc.), missing data analysis (missing at random, EM algorithms etc.), neural networks with the introduction to deep learning.	
<b>Teaching and learning methods</b>	2 SWS lecture and independent study.	
<b>Requirements for participation</b>	The competencies to be acquired in the module Theoretical Multivariate Statistics are required.	
<b>Usability</b>	The module is a compulsory elective module of the specialization Statistics of the module group Specializations in the Master's program Transportation Economics, of which two out of five have to be chosen. It provides the prerequisite for the module Research Task in Statistics. Furthermore, the module is a compulsory elective module in the area of Transportation Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points must be chosen. The module cannot be taken if it has already been chosen in the module group Specializations.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. For more than 20 registered students, the module examination consists of a written examination of 120 minutes duration. For up to 20 registered students, it consists of an oral examination in the form of an individual examination of 30 minutes duration; if necessary, this will be announced to the registered students in writing at the end of the registration period.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	



<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 43	Research Task in Statistics	Prof. Dr. Ostap Okhrin (ostap.okhrin@tu-dresden.de)
<b>Qualification aim</b>	Students are able to work independently and comprehensively on a research question from the specialization area of transport econometrics and transport statistics using economic methods, and to present, discuss and assess the research results. They know the methods of scientific work. They have key qualifications with regard to research methodology, rhetoric and presentation. Furthermore, the students are strengthened in their personality.	
<b>Content</b>	The content of the module is the independent work on a scientific problem from the field of transport econometrics and transport statistics as well as its discussion and presentation.	
<b>Teaching and learning methods</b>	2 SWS seminar and independent study.	
<b>Requirements for participation</b>	The competences to be acquired in the modules Applied Multivariate Statistics and Data-Driven Multivariate Statistics are required. Prerequisite for the participation in the module according to § 25 paragraph 2 Examination Regulations are the previously passed modules Applied Multivariate Statistics and Data-Driven Multivariate Statistics.	
<b>Usability</b>	The module is a compulsory elective module of the module group Research Papers in the Master's program Transportation Economics, of which one out of five has to be chosen.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion of the results in the extent of 400 hours.	
<b>Credit points and grades</b>	15 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 450 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-PFL 50	Methods in Data Analytics	Prof. Dr. Pascal Kerschke (pascal.kerschke@tu-dresden.de)
<b>Qualification aim</b>	The students know basic methods of data analysis. In addition, they are able to apply these methods and to recognize and solve problems that arise in the process.	
<b>Content</b>	The content of the module is theoretical concepts and the application of basic data analysis methods relevant for working with traffic-related data.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	Basic knowledge of statistics and data analytics at the undergraduate level is required. The following literature is suitable for preparation: Heumann, C., Schomaker Shalab, M.: Introduction to Statistics and Data Analysis, Springer, 2016.	
<b>Usability</b>	The module is a compulsory module in the master's program Transportation Economics. It provides the prerequisite for the modules Advanced Methods in Data Analytics, Application of Data Analytics, and Vocational Internship.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 51	Advanced Methods in Data Analytics	Prof. Dr. Pascal Kerschke (pascal.kerschke@tu-dresden.de)
<b>Qualification aim</b>	Students are familiar with advanced methods of data analysis that enable them to analyze data in depth. Furthermore, they are able to apply these methods and to recognize and solve problems that arise in the process. Furthermore, the students are strengthened in their personality.	
<b>Content</b>	The content of the module is theoretical concepts and the application of advanced methods of data analysis relevant to the processing of traffic-related data. These are treated with reference to current research.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	The competencies to be acquired in the Methods in Data Analytics module are required.	
<b>Usability</b>	The module is a compulsory elective module of the specialization Data Analytics in Transportation of the module group Specializations in the master's program Transportation Economics, of which two out of five have to be chosen. It provides the prerequisite for the module Research Task in Data Analytics in Transportation. Furthermore, the module is a compulsory elective module in the area of Transportation Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points must be chosen. The module cannot be taken if it has already been selected in the module group Specializations.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 52	Application of Data Analytics	Prof. Dr. Pascal Kerschke (pascal.kerschke@tu-dresden.de)
<b>Qualification aim</b>	Students are proficient in specific methods of data analysis in a selected field of application. They are able to apply these methods, to develop concepts of data analysis to solve specific problems in the application field and to recognize and resolve challenges that arise in the process. Furthermore, the students are strengthened in their personality.	
<b>Content</b>	The content of the module covers the specific methods of data analysis required for the field of application as well as the use of these methods to solve relevant problems. The content is based on the current state of research.	
<b>Teaching and learning methods</b>	2 SWS seminar and independent study.	
<b>Requirements for participation</b>	The competencies to be acquired in the Methods in Data Analytics module are required.	
<b>Usability</b>	The module is a compulsory elective module of the specialization Data Analytics in Transportation of the module group Specializations in the Master's program Transportation Economics, of which two out of five have to be chosen. It provides the prerequisite for the module Research Task in Data Analytics in Transportation. Furthermore, the module is a compulsory elective module in the field of Transportation Economics of the module group Supplements in the Master's program Transportation Economics, of which modules amounting to 30 credit points have to be chosen. The module cannot be taken if it has already been selected in the module group Specializations.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a project work in the extent of 100 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-SPE 53	Research Task in Data Analytics in Transportation	Prof. Dr. Pascal Kerschke (pascal.kerschke@tu-dresden.de)
<b>Qualification aim</b>	Students are able to independently develop comprehensive concepts for data analysis to solve specific problems, to present, discuss and assess scientific research results in a sophisticated manner and to prepare scientific research papers in a qualified manner. They have key qualifications in rhetoric, presentation and presentation techniques. Furthermore, the students are strengthened in their personality.	
<b>Content</b>	The content of the module is the independent processing of scientifically relevant questions as well as their discussion and presentation in the application of methods of data analytics to transport economic questions on the company level or on the level of society.	
<b>Teaching and learning methods</b>	2 SWS seminar and independent study.	
<b>Requirements for participation</b>	The competences to be acquired in the modules Advanced Methods in Data Analytics and Application of Data Analytics are required. Prerequisite for the participation in the module according to § 25 paragraph 2 of the examination regulations are the previously passed modules Advanced Methods in Data Analytics and Application of Data Analytics.	
<b>Usability</b>	The module is a compulsory elective module of the module group Research Papers in the Master's program Transportation Economics, of which one out of five has to be chosen.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion of the results in the extent of 400 hours.	
<b>Credit points and grades</b>	15 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 450 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-ERG 24	Current Topics in Transport Policy	Dr. Stefan Tscharaktschiew (stefan.tscharaktschiew@tu-dresden.de)
<b>Qualification aim</b>	The students are able to work out relevant contents for a selected main topic of transport policy both independently and in a group, present them and discuss them in detail and critically. The students know the social relevance of transport policy issues and are able to develop solutions that are beneficial to society as a whole.	
<b>Content</b>	The content is current socio-political issues of transport policy with research relevance.	
<b>Teaching and learning methods</b>	2 SWS seminar and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the area of transportation economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion of the results in the extent of 100 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered once every two academic years in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-ERG 25	Cost-Benefit Evaluation of Infrastructure Projects and Traffic Law	Prof. Dr. Georg Hirte (georg.hirte@tu-dresden.de)
<b>Qualification aim</b>	The students know practice-relevant economic evaluation methods in the planning of traffic facilities. The students are able to record legally relevant location change processes of persons, goods and information (messages) and to classify them into the respective legal categories on the basis of the laws and regulations of traffic law. The students have social skills for the recording of facts and appropriate enforcement or defense of claims, especially for communication with authorities, courts, clients as well as third parties in the field of traffic law. Students have knowledge, skills and abilities in the field of traffic law. They are able to apply their knowledge in solving smaller legal cases in the field of road traffic and railroad traffic law and to assess the role of administrative jurisdiction.	
<b>Content</b>	The contents of the module are the evaluation methods of the Federal Transport Infrastructure Planning, in particular the standardized evaluation for public transport as well as the recommendation for economic efficiency studies of roads. Furthermore, important basics of traffic law are part of the module.	
<b>Teaching and learning methods</b>	4 SWS lecture in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the area of transportation economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 120 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-ERG 34	Current Topics in Spatial and Environmental Economics	Prof. Dr. Georg Hirte (georg.hirte@tu-dresden.de)
<b>Qualification aim</b>	Students are familiar with current theoretical discussions and applied problems in the field of spatial economics, especially those related to transport and environmental economics. They are able to prepare current questions of spatial economics, to structure problems, to develop solutions in a team, to present them and to defend them in discourse. The students are able to assess socio-politically relevant issues and thus have the ability to decide and act responsibly for society as a whole.	
<b>Content</b>	The content of the module is current socio-political issues in spatial economics with research relevance.	
<b>Teaching and learning methods</b>	2 SWS seminar and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the area of transportation economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion of the results in the amount of 100 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered once every third academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-ERG 44	Methods in Transportation Econometrics and Statistics	Dr. Martin Treiber (martin.treiber@tu-dresden.de)
<b>Qualification aim</b>	Students have an in-depth understanding of empirical and model-theoretical methods of essential problem areas in transport planning and transport economics in general. They are familiar with the statistical and analytical procedures for model building and system analysis in transport econometrics, with a particular focus on modeling discrete choice decisions, for example in mode choice.	
<b>Content</b>	Contents of the module include the formulation of economic theories or the decisions of individuals in a transportation context through mathematical models and the analysis of data through various statistical techniques.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	Knowledge of statistics and mathematics at the undergraduate level is required. The following literature is suitable for preparation: Sydsaeter, K.; Hammond, P.: Essential Mathematics for Economic Analysis, Financial Times Prentice Hall, Harlow, newest edition. Bamberg, G., Baur, F., Krapp, M.: Statistik, Oldenbourg Verlag, München, newest edition.	
<b>Usability</b>	The module is a compulsory elective module in the area of transportation economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 120 minutes duration.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-ERG 45	Traffic Flow Dynamics and Simulation	Dr. Martin Treiber (martin.treiber@tu-dresden.de)
<b>Qualification aim</b>	Students know the different types and analysis methods of traffic data, especially detector data and the floating car data generated by smart-phones and navigation devices. They have in-depth knowledge of micro- and macroscopic traffic flow modeling, including cyclists and pedestrians. In addition, they know important concrete applications, such as traffic position estimation, navigation, traffic control, and vehicle-based traffic flow optimization.	
<b>Content</b>	The module includes the modeling of traffic flows in road traffic as well as that of pedestrians.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	Knowledge of mathematics, statistics, and transportation econometrics at the undergraduate level is required. The following literature is suitable for preparation: Bamberg, G., Baur, F., Krapp, M.: Statistik, Oldenbourg Verlag, München, newest edition.	
<b>Usability</b>	The module is a compulsory elective module in the area of transportation economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 120 minutes duration.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-ERG 225	Cost-Benefit Evaluation of Infrastructure Projects	Prof. Dr. Georg Hirte georg.hirte@tu-dresden.de
<b>Qualification aim</b>	The students know practice-relevant economic evaluation methods in the planning of traffic facilities.	
<b>Content</b>	The contents of the module are the evaluation methods of the Federal Transport Infrastructure Planning, in particular the standardized evaluation for public transport as well as the recommendation for economic efficiency studies of roads.	
<b>Teaching and learning methods</b>	2 SWS lecture in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the area of transportation economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 101	Applied Computer Science	Dr. Mykola Sysyn (mykola.sysyn@tu-dresden.de)
<b>Qualification aim</b>	Students are able to deal with computer-aided engineering and engineering practice work methods based on CAD systems, the commonly available office application and programming environment, and the possibilities of data and tool integration. They are able to solve routing problems in a geometrically correct manner using general CAD software, have knowledge and practices on the fundamentals of macro programming, and are able to develop software solutions to engineering problems based on basic numerical mathematics techniques. Students will be able to rationally process engineering projects using the essential capabilities of current computing resources across programs.	
<b>Content</b>	Contents of the module are: <ul style="list-style-type: none"> <li>- CAD-supported geometric routing of track systems,</li> <li>- Basics of Marko programming,</li> <li>- development of software-technical solutions for engineering problems on the basis of numerical mathematics as well as</li> <li>- cross-program problem solving.</li> </ul>	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 102	Safeguarding Railway Operation	PD Dr. Ulrich Maschek (ulrich.maschek@tu-dresden.de)
<b>Qualification aim</b>	Students will be familiar with the components required for safeguarding rail operations (locating components, movable track elements, signals, train control). They understand functional principles and basic safety characteristics. This enables them to apply the components in an overall system. Students are able to derive requirements for track safety from the system properties of rail traffic and to characterize and differentiate between the most important operating procedures with regard to their safety-relevant components. They are able to distinguish between the basic technologies of track safety.	
<b>Content</b>	<p>Contents of the module are:</p> <ul style="list-style-type: none"> <li>- Basics of safety technology components such as locating components, movable track elements, signaling and train control as well as</li> <li>- - Fundamentals of track safety such as requirements and technologies as well as techniques.</li> </ul>	
<b>Teaching and learning methods</b>	3 SWS lecture, 1 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	<p>A-level physics knowledge in the areas of kinematics, dynamics, and electrical engineering is required.</p> <p>The following literature is suitable for preparation: Maschek, U.: Sicherung des Schienenverkehrs, jeweils aktuelle Auflage, Springer Vieweg, Wiesbaden.</p>	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected. It provides the prerequisite for the modules Railway Signalling and Planning of Signalling Facilities.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	



<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 103	Railway Signalling	Prof. Jochen Trinckauf (jochen.trinckauf@tu-dresden.de)
<b>Qualification aim</b>	Students are able to analyze and evaluate the safety relevance of technical control systems. They can distinguish and evaluate the most important concepts of system design in relay technology and electronics. The students have in-depth knowledge of components and systems and also the knowledge of basic technologies and techniques for the dispositive control of railroad systems. As a result, students are able to analyze and evaluate different techniques.	
<b>Content</b>	Content of the module are: <ul style="list-style-type: none"> <li>- Safety-relevant information processing,</li> <li>- In-depth study of the components of safety technology such as locating components, movable track elements, signaling and train control,</li> <li>- control technology and</li> <li>- - Safety science.</li> </ul>	
<b>Teaching and learning methods</b>	4 SWS lecture in german language and independent study.	
<b>Requirements for participation</b>	The competencies to be acquired in the Safeguarding Railway Operation module are required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of an oral examination with a duration of 30 minutes as a group examination. The language of the examination is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 104a	Operational Processes and Operational Planning in Public Passenger Transport	Steffen Dutsch (steffen.dutsch@tu-dresden.de)
<b>Qualification aim</b>	Students will be able to apply basic methods and procedures for designing customer-oriented transport services and economic operations in public transport. They understand public transport as a system as well as part of the environment and are able to plan essential resources as well as basic processes in passenger transport in a goal-oriented manner and to manage them efficiently.	
<b>Content</b>	The contents of the module are Public Transportation and its Worldwide Distribution, Basic Time Elements, Line Planning, Trip Planning, and Carriage Scheduling.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical, each in german language, independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected. It provides the prerequisite for the modules Operational Planning and Operational Management in Public Transport and Operation of Urban and Regional Public Transport.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 105	Planning, Construction and Operation of Local Traffic Systems, Special lecture	Dr. Sven Hietzschold (sven.hietzschold@tu-dresden.de)
<b>Qualification aim</b>	Students will be familiar with the various forms of mass transit railroads and how they function. They are able to explain the areas of application and differences between the various forms of local transport railroads in the form of streetcars, light railroads, subway railroads and urban railroads. They are familiar with the requirements from a traffic, construction and operational point of view and they can explain the resulting current construction and operation methods. Students will be able to explain the special problems of mass transit railroads and relate them to their backgrounds as they occur in construction and operational practice.	
<b>Content</b>	Content of the module are: <ul style="list-style-type: none"> <li>- Mass transit systems nationally and internationally,</li> <li>- Aspects of mixed operation and local transport history,</li> <li>- Layout design of tramways, urban railroads, elevated railroads and underground railroads,</li> <li>- tramway track design,</li> <li>- vehicles, tracks and installations of commuter railroads, and</li> <li>- operational planning and management of commuter railroads.</li> </ul>	
<b>Teaching and learning methods</b>	4 SWS lecture in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 106	Railway Construction	Dr. Ulf Gerber (ulf.gerber@tu-dresden.de)
<b>Qualification aim</b>	The students are familiar with the construction method of the track of railroads, especially railroads. The students can explain standard construction methods and special designs of tracks and switches as well as model and calculate them. Furthermore, they are able to explain the damage processes of the railroad superstructure, perform damage assessment and develop concepts for damage repair with the aim of minimizing life cycle costs. Students are able to understand and calculate different, also novel, design methods and assess them against the background of their expected long-term behavior.	
<b>Content</b>	Content of the module are: <ul style="list-style-type: none"> <li>- Track surface defects and track surface fatigue,</li> <li>- Stability of the gapless track,</li> <li>- Rail dimensioning and determination of rail service life,</li> <li>- Optimal design of the ballast superstructure and optimization of maintenance, and</li> <li>- - Determination of the life cycle costs of the permanent way.</li> </ul>	
<b>Teaching and learning methods</b>	3 SWS lecture, 1 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	Knowledge of transportation economics at the undergraduate level is required. The following literature is suitable for preparation: Fendrich/Fengler (Hrsg.): Handbuch Eisenbahninfrastruktur. Berlin: Springer-Verlag, newest edition: Kapitel 2: Auslegung des Eisenbahnoberbaus.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper in the extent of 60 hours. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 107	Management of Plant Construction Projects	Prof. Jörg Schütte (joerg.schuette@tu-dresden.de)
<b>Qualification aim</b>	The students possess basic knowledge and skills for project management in plant and rail vehicle construction. Students are able to assess the applicability of standards, describe these standards and apply them to specific projects. They are familiar with project management methods and procedures in various project phases and can select and apply them with regard to their project-specific suitability. Students will be able to independently transform sets of rules into concrete instructions for project documents and to structure the individual phases of a project (from the offer to project completion). They are familiar with the project-like working method in the traffic engineering profession and can participate in it. They know how to take into account special requirements resulting from the consideration of social and intercultural issues in projects.	
<b>Content</b>	The content of the module includes the motives and basics of project management, the organizational structure and process organization of projects, project management methods, especially in cooperation with stakeholders, as well as project initiation, project planning, project control and project completion.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 108	Operational Planning and Operational Management in Public Transport	Steffen Dutsch (steffen.dutsch@tu-dresden.de)
<b>Qualification aim</b>	Students will be able to apply a variety of methods and procedures to design a customer-oriented range of services and cost-effective operations in public transport. They understand public transport in cities and regions as a complex system as well as part of the overall transport system and are able to plan resources as well as processes holistically, to control them efficiently and to manage them in a goal-oriented manner. Students have a sound knowledge of the planning, control and management of public transport under a wide range of constraints. This also enables them to further develop its scientific foundations and to exert a targeted influence on the current and future environment of public transport.	
<b>Content</b>	The content of the module are: <ul style="list-style-type: none"> <li>- Carriage scheduling,</li> <li>- duty scheduling,</li> <li>- Integrated planning and</li> <li>- Route network planning.</li> </ul>	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	The competences to be acquired in the module Operational Processes and Operational Planning in Public Passenger Transport as well as the confident handling of the methods and procedures taught there for the design of a customer-oriented transport offer and economic operation in public transport are required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 150 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 109	Operation of Urban and Regional Public Transport	Steffen Dutsch (steffen.dutsch@tu-dresden.de)
<b>Qualification aim</b>	Students are familiar with special methods and procedures for designing a customer-oriented range of services and economic operations in public urban and regional transport. They are able to plan and deploy resources and processes in a goal-oriented and efficient manner, even in complicated and very special cases. The students have extensive knowledge of the planning and operational process in urban and regional transport for different regular and disruptive cases and are proficient in a wide range of instruments for this purpose. This enables them to solve even difficult tasks of planning and operations management in urban and regional transport in a holistic manner, to shape the framework conditions of public transport in a contemporary manner and to further develop its scientific basis.	
<b>Content</b>	The content of the module are: <ul style="list-style-type: none"> <li>- Operating procedure,</li> <li>- performance,</li> <li>- Operational aspects of public transport systems and vehicles,</li> <li>- Software-supported operational planning in public transport, and</li> <li>- - Organization of public transport in special cases.</li> </ul>	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	The competences to be acquired in the module Operational Processes and Operational Planning in Public Passenger Transport as well as the confident handling of the methods and procedures taught there for the design of a customer-oriented transport offer and economic operation in public transport are required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. For more than 20 registered students, the module examination consists of a written examination of 90 of minutes duration. For up to 20 registered students, it consists of an oral examination in the form of an individual examination of 35 minutes duration; if necessary, this will be announced to the registered students in writing at the end of the registration period. The language of the examination is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	

<b>Frequency of module</b>	The module is offered each academic year in the summer semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 110	Planning and Design of Railway Systems	Dr. Sven Hietzschold (sven.hietzschold@tu-dresden.de)
<b>Qualification aim</b>	Students are familiar with the issues and problems of planning, design and construction of railroad facilities. They have knowledge of the methods of functional design of lines and stations and of alignment, traffic and civil engineering design based on traffic and operational requirements. They are able to understand, analyze and calculate railroad engineering design tasks.	
<b>Content</b>	<p>Contents of the module are:</p> <ul style="list-style-type: none"> <li>- Routing of complex track systems such as curved switches, curved track connections, switches in transition curves and curved track distortions,</li> <li>- Dimensioning of track spacing, taking into account the requirements of the clearance gauge, occupational safety, fixtures near the track, etc.,</li> <li>- safety aspects of plant design,</li> <li>- layout, design and construction of platforms,</li> <li>- planning and design of complex passenger and freight facilities from the traffic, operational and civil engineering point of view, as well as</li> <li>- Design of level crossing facilities.</li> </ul>	
<b>Teaching and learning methods</b>	4 SWS lecture in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 120 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year, beginning in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts two semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 111	Planning of Signalling Facilities	PD Dr.-Ing. habil. Ulrich Maschek (u.maschek@tu-dresden.de)
<b>Qualification aim</b>	In the field of interlocking logic, students have in-depth knowledge of technologies for route safety. They are able to apply and analyze them. Students are able to independently perform basic interlocking planning tasks and acquire further knowledge and skills. The focus is on the preparation of safety-related planning documents for electronic interlockings.	
<b>Content</b>	This module covers the procedure for planning control and safety systems.	
<b>Teaching and learning methods</b>	3 SWS lecture, 1 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	Knowledge of railroad operation safeguarding, such as that required in the Fundamentals of Transport Engineering module of the Bachelor's degree program in Transport Economics and the skills to be acquired in the Safeguarding Railway Operation module are required. The following literature is suitable for preparation: Maschek: Sicherung des Schienenverkehrs, Springer-Verlag Wiesbaden, newest edition. Basic knowledge of AutoCAD is also desirable.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration and a term paper in the extent of 30 hours. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the weighted average of the grades of the two examination performances. The grade of the written examination is weighted six times, the grade of the term paper four times.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

Number of module	Name of module	Lecturer
VW-TEc-MA-VIW 112a	Aerodynamics and Flight Performance	Prof. Hartmut Fricke (hartmut.fricke@tu-dresden.de)
<b>Qualification aim</b>	Students know the methods and applications that describe the motion of aircraft with 6 degrees of freedom with the associated forces and moments, powers and energy expenditures. They also understand the origin and influence of air forces/moments on the aircraft. The students are able to mathematically model important variables influencing flight performance and flight characteristics. In addition, they are able to assess the operational behavior of the aircraft in relation to the flight condition with regard to safety, economy and environmental compatibility. Students will also understand the main engine assembly in terms of its structure, mode of operation and operating behavior and will be able to assess various aircraft propulsion systems in an informed manner.	
<b>Content</b>	<p>Content of the module are:</p> <ul style="list-style-type: none"> <li>- Operational behavior of an aircraft in the different flight conditions,</li> <li>- Target functions and variants of cruise flight performance,</li> <li>- ETOPS regulation and flight performance calculation,</li> <li>- Basics of thrust diagrams and speed polars,</li> <li>- Properties of air,</li> <li>- Lift and its generation as well as associated air forces and air force moments,</li> <li>- aerodynamics, flight mechanics and aerodynamic characteristics (polars),</li> <li>- the airfoil and airfoil geometry,</li> <li>- the establishment of the moment equilibrium</li> <li>- the load, trimability and required aircraft control,</li> <li>- Fundamentals of thermodynamics and gas dynamics, especially p-v and T-s diagrams of OTTO and JOULE process,</li> <li>- flow through diffusers and nozzles,</li> <li>- the structure, functioning and operating behavior of gas turbine assemblies, as well as</li> <li>- material and running time problems in gas turbine engines.</li> </ul>	
<b>Teaching and learning methods</b>	<p>7 SWS lecture, 1 SWS practical, 0,5 SWS laboratory training and independent study.</p> <p>The teaching language of the lecture, practical and laboratory training can be German or English and will be specifically determined by the lecturer at the beginning of each semester and announced as usual in the faculty.</p>	
<b>Requirements for participation</b>	<p>Knowledge of transportation economics at the undergraduate level is required.</p> <p>The following literature is suitable for preparation: Sydsaeter, K.; Hammond, P.: Essential Mathematics for Economic Analysis, Financial Times Prentice Hall, Harlow, newest edition; Airbus Customer Service</p>	

	(Hrsg.): Getting to grips with aircraft performance; McClamroch, N. Harris: Steady Aircraft Flight and Performance, Princeton Univ. Press, Princeton, aktuelle Auflage; John David Anderson: Fundamentals of aerodynamics, McGraw-Hill, New York, 2011,; Doug McLean: Understanding Aerodynamics: Arguing from the Real Physics, Wiley-Blackwell, Chichester, 2013.
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 240 minutes duration. Preliminary examination is a semester paper with a duration of 120 minutes. The examination language is English or German at the student's choice.
<b>Credit points and grades</b>	10 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.
<b>Workload</b>	The total workload is 300 hours.
<b>Duration of the module</b>	The module lasts one semester.

Number of module	Name of module	Lecturer
VW-TEc-MA-VIW 113	CNS and Tactical ATM	Prof. Hartmut Fricke (hartmut.fricke@tu-dresden.de)
<b>Qualification aim</b>	The students are familiar with the procedures of radio, inertial and satellite navigation and understand technical navigation systems with their tasks, structure and mode of operation. They also understand the planning, organization and implementation of air traffic control and know about the necessary operational-technical systems for communication and monitoring of air traffic.	
<b>Content</b>	<p>Content of the module are:</p> <ul style="list-style-type: none"> <li>- geodetic and cartographic basics,</li> <li>- radio navigation/location systems technology,</li> <li>- inertial navigation,</li> <li>- satellite navigation,</li> <li>- the principles of procedure design,</li> <li>- the principles of airspace utilization in relation to given capacities,</li> <li>- airport coordination procedures,</li> <li>- traffic flow control of network operations,</li> <li>- the tactical control measures of air traffic control as well as air traffic control operational services,</li> <li>- the organization and implementation of air traffic control and its future concepts, and</li> <li>- the airborne and ground-based systems and technologies of communication and surveillance.</li> </ul>	
<b>Teaching and learning methods</b>	<p>6 SWS lecture, 1 SWS practical, 1 SWS laboratory training and independent study.</p> <p>The teaching language of the lecture, practical and laboratory training can be German or English and will be specifically determined by the lecturer at the beginning of each semester and announced as usual in the faculty.</p>	
<b>Requirements for participation</b>	<p>Knowledge of transportation economics at the undergraduate level is required.</p> <p>The following literature is suitable for preparation: Sydsaeter, K.; Hammond, P.: Essential Mathematics for Economic Analysis, Financial Times Prentice Hall, Harlow, newest edition; Frank W. Fischer: Active air traffic flow control, 1976; Clinton V. Oster, John S. Strong: Managing the skies, Ashgate, Aldershot, 2007; Detlef Schleicher: Digital VHF data link for air traffic control, Shaker, Aachen, 2000.</p>	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	

<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 240 minutes duration. The language of the examination is English or German at the student's choice.
<b>Credit points and grades</b>	10 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.
<b>Workload</b>	The total workload is 300 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 114	Flight Planning and Aircraft Operations	Prof. Hartmut Fricke (hartmut.fricke@tu-dresden.de)
<b>Qualification aim</b>	With the help of meteorological knowledge, students are able to develop and evaluate the essential documents for the safe, economical, punctual and regular flight operations of an airline. They know the flight operations tasks (operating procedures) and have a detailed command of the central elements of cockpit equipment. In addition, students understand the structure, operation of fly-by-wire technology in aircraft as well as the possibilities of modern avionics for achieving economical and environmentally compatible flight operations.	
<b>Content</b>	Content of the module are: <ul style="list-style-type: none"> <li>- the structure of the atmosphere,</li> <li>- the basic meteorological elements,</li> <li>- synoptic meteorology,</li> <li>- meteorological hazards,</li> <li>- aeronautical meteorological consulting and support,</li> <li>- problems of weather forecasting, and tasks and organization of flight operations services,</li> <li>- Flight preparation procedures (operational and ATC flight plan) and traffic flow control,</li> <li>- Navigation procedures/tasks and organization of flight operations services,</li> <li>- Crew Resource Management (CRM),</li> <li>- flight operations technology, and</li> <li>- Cockpit equipment/avionics and their future developments.</li> </ul>	
<b>Teaching and learning methods</b>	4 SWS lecture, 0,5 SWS practical, 0,5 SWS laboratory training and independent study. The teaching language of the lecture, practical and laboratory training can be German or English and will be specifically determined by the lecturer at the beginning of each semester and announced as usual in the faculty.	
<b>Requirements for participation</b>	Knowledge of transportation economics at the undergraduate level is required. The following literature is suitable for preparation: Donald J. Clausing: The aviator's guide to flight planning, Blue Ridge Summit, Pa.: TAB Books, 1989; Air Pilot's Manual - 4 Aeroplane - general knowledge : principles of flight, aircraft general, flight planning & performance, Shoreham Airport: Pooleys-Air Pilot Publ., 2014; N. Ashford, H. P. M. Stanton, C. A. Moore: Airport Operations, McGraw-Hill, New York, 2013; H. C. Wieske-Hartz: Airline Operation, NARA-Verlag, Allershausen, 2000.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's	

	program Transportation Economics, of which modules amounting to 30 credit points are to be selected.
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 180 minutes duration. The language of the examination is English or German at the student's choice.
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 115	Safety and Airline Management	Prof. Hartmut Fricke (hartmut.fricke@tu-dresden.de)
<b>Qualification aim</b>	After completing the module, students will have knowledge of structures and measures to ensure aviation safety. They are familiar with system-immanent and non-system-immanent influencing variables on air traffic safety and know the common methods for evaluating and quantifying the safety of air traffic. Students also understand the objectives, structure and implementation of safety management systems at airports, ground handlers and, in particular, airlines (airline), their concerns and objectives for flight and airport operations and their specific management functions.	
<b>Content</b>	Content of the module are: <ul style="list-style-type: none"> <li>- general traffic safety relevant characteristics of air traffic and influencing factors on air traffic safety (Safety),</li> <li>- general quantitative assessment possibilities of air traffic safety (Safety),</li> <li>- Requirements and general conditions for the management and flight operations of an airline,</li> <li>- business strategies and corporate forms of airlines,</li> <li>- the role of aviation safety in airline management, and</li> <li>- safety management at airports and airlines.</li> </ul>	
<b>Teaching and learning methods</b>	3 SWS lecture, 1 SWS practical and independent study. The teaching language of the lecture and practical can be German or English and will be specifically determined by the lecturer at the beginning of each semester and announced in the usual way by the faculty.	
<b>Requirements for participation</b>	Knowledge of transportation economics at the undergraduate level is required. The following literature is suitable for preparation: Sydsaeter, K.; Hammond, P.: Essential Mathematics for Economic Analysis, Financial Times Prentice Hall, Harlow, newest edition; EASA (Hrsg.): ICAO Annex 19 ‚Safety Management‘, 2019; ICAO (Hrsg.): Doc 9859 ‚Safety Management Manual‘, 2018; EUROCONTROL (Hrsg.): Safety Assessment Methodology (SAM).	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master’s program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 180 minutes duration. The language of the examination is English or German at the student's choice.	

<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 116	Terminal Operations	Prof. Hartmut Fricke (hartmut.fricke@tu-dresden.de)
<b>Qualification aim</b>	The students have knowledge of structures and measures to ensure aviation security. They can evaluate different security strategies specifically for terminal operations. Students are also able to describe the individual processes of passenger handling in the terminal with the aid of specific parameters and to model these operating processes. Students will be able to develop and apply stochastic-based models.	
<b>Content</b>	Content of the module are: <ul style="list-style-type: none"> <li>- Characterization of operating and movement processes in the terminal, such as general factors influencing aviation security,</li> <li>- Procedures and guidelines for emergency management,</li> <li>- Procedures for the assessment of hazard potentials,</li> <li>- modeling of operation and movement processes in the terminal of an airfield as well as</li> <li>- Requirements and design criteria for control systems in terminals.</li> </ul>	
<b>Teaching and learning methods</b>	3 SWS lecture, 1 SWS practical and independent study. The teaching language of the lecture and practical can be German or English and will be specifically determined by the lecturer at the beginning of each semester and announced as usual in the faculty..	
<b>Requirements for participation</b>	Knowledge of transport economics at bachelor level is required. In addition, a sound knowledge of office applications comparable to MS EXCEL or a programming language such as JAVA is expected. The following literature is suitable for preparation: Sydsaeter, K.; Hammond, P.: Essential Mathematics for Economic Analysis, Financial Times Prentice Hall, Harlow, newest edition; J. Neter, W. Wasserman, G. A. Whitmore: Applied statistics, Allyn and Bacon, Boston, 1993; A. Johansson: Data-Driven Modeling of Pedestrian Crowds, Dissertation, Dresden, 2009.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 120 minutes duration. Preliminary examination for the examination is a semester paper in the extent of 20 hours. The examination language is English or German at the student's choice.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	

<b>Frequency of module</b>	The module is offered each academic year in the summer semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

Number of module	Name of module	Lecturer
VW-TEc-MA-VIW 117	Helicopter Technology	Prof. Christoph Keßler (christoph.kessler@tu-dresden.de)
<b>Qualification aim</b>	<p>The students know different rotorcraft variants and essential helicopter systems. Students will be able to roughly estimate the power requirements of a rotor. The participants will also be able to apply an improved method for calculating the power of the overall helicopter. They will also be able to derive the forces and moments on the rotor blade that are needed to set up the rotor blade motion differential equations and will know couplings between the blade degrees of freedom. In addition, students will be able to evaluate key design parameters for helicopter design and will be able to apply rotor dynamics techniques for stability analysis. They will learn about a dynamic rotor wake model, coupled rotor-cell vibration problems, and flight characteristics guidelines and methods for flight characteristics analysis. Finally, students will know where the vibrations of a helicopter come from and how they can be reduced.</p>	
<b>Content</b>	<p>Content of the module are:</p> <ul style="list-style-type: none"> <li>- Introduction to the history of helicopter development and its characteristics,</li> <li>- Methods of momentum theory for rotor performance considerations,</li> <li>- Blade element theory,</li> <li>- Performance considerations of the entire helicopter,</li> <li>- Design fundamentals of helicopters,</li> <li>- Control systems for helicopters,</li> <li>- Coupling effects of rotor blade motion,</li> <li>- stability analysis of rotor blades,</li> <li>- dynamic downwind model,</li> <li>- coupled rotor-cell oscillations,</li> <li>- flight dynamics of helicopters, and</li> <li>- Cause of vibrations in the airframe.</li> </ul>	
<b>Teaching and learning methods</b>	4 SWS lecture in german language and independent study.	
<b>Requirements for participation</b>	<p>Knowledge of transportation economics at the undergraduate level is required.</p> <p>The following literature is suitable for preparation: Sydsaeter, K.; Hammond, P.: Essential Mathematics for Economic Analysis, Financial Times Prentice Hall, Harlow, newest edition.</p>	
<b>Usability</b>	<p>The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.</p>	

<b>Requirements for the award of credits</b>	<p>The credit points are awarded when the module examination is passed. The module examination consists of an oral examination performance as an individual examination of 45 minutes duration. The examination language is German.</p> <p>If there are more than 15 registered students, the oral examination will be replaced as an individual examination by a written examination of 120 minutes duration; if necessary, this will be announced to the registered students in writing at the end of the registration period. The examination language of the written paper is German.</p>
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.
<b>Frequency of module</b>	The module is offered each academic year, beginning in the summer semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts two semesters.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 118b	Technologies of Road Traffic Control	Matthias Körner (mathias.koerner@tu-dresden.de)
<b>Qualification aim</b>	Students are able to independently generate, test and evaluate control sequences for traffic signal systems. In addition to the control of individual systems, the students master coordinated and traffic-dependent control systems in their practical environment. The students are able to classify and evaluate procedures and methods of superordinate control procedures that include road trains and road networks.	
<b>Content</b>	The content of the module is the fundamentals of traffic theory and practical applications for traffic control, with an emphasis on traffic signal control.	
<b>Teaching and learning methods</b>	4 SWS lecture, 1 SWS practical and independent study. The teaching language of the lecture and practical can be German or English and will be specifically determined by the lecturer at the beginning of each semester and announced in the usual way by the faculty.	
<b>Requirements for participation</b>	Knowledge of transportation economics at the undergraduate level is required. The following literature is suitable for preparation: N. A. Kheir et al.: Control systems engineering education, Automatica 32.2, 1996, 147-166; M. Cavazzuti: Optimization Methods, Springer, Berlin/Heidelberg, 2013.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected. Parallel attendance of the following module is excluded: Evaluation Procedures for Traffic Facilities.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. If there are more than 5 registered students, the module examination consists of a written examination of 120 minutes duration. For up to 5 registered students, it consists of an oral examination as an individual examination of 30 minutes duration; if necessary, this will be announced to the registered students in writing at the end of the registration period. The language of the examination is German. The preliminary requirement for the examination is the preparation of a semester paper in the extent of 2 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	

<b>Duration of the module</b>	The module lasts one semester.
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<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 119a	Optimal Control Methods and Algorithms for Decision Making Problems	Prof. Meng Wang meng.wang@tu-dresden.de
<b>Qualification aim</b>	The students know the basic procedures of optimal control or decision making, procedures for determining optimal trajectories (control) as well as important methods and procedures. They are able to design optimal controllers for traffic processes and are able to apply and discuss them in practice-relevant tasks from the traffic sector with the help of suitable tools. Furthermore, students can apply methods and procedures to make control decisions for complex traffic systems based on incomplete process state information in an efficient and computer-aided way and discuss them.	
<b>Content</b>	The content of the module is the control and regulation of single vehicles as well as multiple vehicles. Optimization approaches for the control of traffic systems are presented and tested. Besides theoretical basics, applications of the methods are presented and discussed.	
<b>Teaching and learning methods</b>	4 SWS lecture, 3 SWS practical, 1 SWS seminar and independent study.	
<b>Requirements for participation</b>	Knowledge of transportation economics at the undergraduate level is required. The following literature is suitable for preparation: N. Nise: Control Systems Engineering, EMEA Edition; M. Cavazzuti: Optimization Methods, Springer, Berlin/Heidelberg, 2013; M. Lutz: Programming Python, O'Reilly, Sebastopol/Calif., 2011.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. For more than 5 registered students, the module examination consists of a written examination of 120 minutes duration. For up to 5 registered students, it consists of an oral examination as an individual examination of 30 minutes duration; if necessary, this will be announced to the registered students in writing at the end of the registration period. The preliminary requirement for the examination is the completion of a semester paper in the extent of 30 hours.	
<b>Credit points and grades</b>	10 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 300 hours.	

<b>Duration of the module</b>	The module lasts one semester.
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<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 120	Transportation Telematics Networks	Prof. Oliver Michler (oliver.michler@tu-dresden.de)
<b>Qualification aim</b>	Students will be able to apply the theoretical principles of the structure, classification, design and operation of traffic telematics networks. They master the principles of layer-by-layer modeling of the functionality of telematics networks and know traffic-specific applications of these networks. Students will be able to design, dimension, evaluate and operate telematics networks.	
<b>Content</b>	Content of the module are theoretical and methodical basics of network design, basics of communication networks and open communication systems, reference models for network platforms and for market participants, monomedial and multimedia service platforms and the specifics of traffic telematic applications as well as standards and framework regulations.	
<b>Teaching and learning methods</b>	3 SWS lecture, 1 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	<p>Knowledge of transportation economics at the undergraduate level is required.</p> <p>The following literature is suitable for preparation: Chaparro LF (2011): Signals and systems using MATLAB, London Academic Press.</p> <p>Cohen Tenoudji, F. (2016): Analog and Digital Signal Analysis From Basics to Applications. Poularikas AD (2007): Signals and systems primer with MATLAB, In The electrical engineering and applied signal processing series. Boca Raton, Fla. [u.a.] CRC.</p> <p>Stearns SD and Hush DR (2011): Digital signal processing with examples in MATLAB, In The electrical engineering and applied signal processing series. Boca Raton, Fla. [u.a.] CRC Press.</p>	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. If there are more than 5 registered students, the module examination consists of a written examination of 90 minutes duration. For up to 5 registered students, it consists of an oral examination performance as an individual examination of 30 minutes duration; if necessary, this will be announced to the registered students in writing at the end of the registration period. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	

<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 121	Theory and Technology of Information Systems	Prof. Oliver Michler (oliver.michler@tu-dresden.de)
<b>Qualification aim</b>	Students will be familiar with the sequence of operations in an information transmission chain, its specific structure and the influence of disruptions. The students are able to independently evaluate electro-technical, information and communication structures of transport telematics both in terms of transport modes and across transport modes in a comparative manner, analyze their function and develop individual components.	
<b>Content</b>	Content of the module are theoretical and technical basics of systems of information technology and their characteristics in practical application and realization. Traffic-specific requirements are given special consideration.	
<b>Teaching and learning methods</b>	3 SWS lecture, 1 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	Knowledge of transportation economics at the undergraduate level is required. The following literature is suitable for preparation: Sydsaeater, K.; Hammond, P.: Essential Mathematics for Economic Analysis, Financial Times Prentice Hall, Harlow, newest edition.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 122	Vehicle Communications and Positioning	Prof. Oliver Michler (oliver.michler@tu-dresden.de)
<b>Qualification aim</b>	Students will be able to master the methodological fundamentals of information technology concepts and systems as well as the fundamentals and procedures of positioning and navigation and their applications specific to modes of transport. Furthermore, students are able to classify, specify and design information systems. They will be able to apply systems for traffic data acquisition, transmission and processing in intelligent traffic systems, integrate positioning and communication systems and assess and evaluate selected mode-specific applications.	
<b>Content</b>	The module covers the fundamentals of traffic telematics information systems for the networking and localization of road users as well as the practical application of such systems, taking into account the specific requirements of the various modes of transport. The theoretical content to be taught includes basic methods of positioning and navigation, especially satellite navigation systems and in-vehicle sensors, as well as the fundamentals of communication systems and their applications in intelligent traffic systems.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. For more than 15 registered students, the module examination consists of a written examination of 90 minutes duration. For up to 15 registered students, it consists of an oral examination of 30 minutes duration as an individual examination; if necessary, this will be announced to the registered students in writing at the end of the registration period. The examination language for both forms of examination is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	

<b>Duration of the module</b>	The module lasts one semester.
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<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 123	Technology Assessment	Dipl.-Ing. Matthias Körner (matthias.koerner@tu-dresden.de)
<b>Qualification aim</b>	Students have the ability to systematically identify and evaluate the consequences of new technologies. They are able to deal with complex issues of technology assessment and technology evaluation from both a structural and a content-related perspective. In doing so, they are able to assess the complex field of tension between technological, ecological, economic, legal and social objectives. They are able to choose suitable structures and are confident in selecting appropriate supporting methods for implementation.	
<b>Content</b>	The content of the module is the motivation, the value bases and the essence of technology assessment as well as the general approach to technology assessment projects. Since technology assessment is a structural framework for a very broad field of application, another focus is on teaching essential supporting methods with their possible applications but also their limitations.	
<b>Teaching and learning methods</b>	4 SWS lecture, 2 SWS practical and independent study. The teaching language of the lecture and practical can be German or English and will be specifically determined by the lecturer at the beginning of each semester and announced in the usual way by the faculty.	
<b>Requirements for participation</b>	Knowledge of transportation economics at the undergraduate level and basic Transportation Engineering principles are required. The following literature is suitable for preparation: Dunn Engineering Associates: Traffic Controls Handbook; Pande; K., Wohlson, B.: Traffic Engineering Handbook, 7th Edition.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion in the extent of 30 hours. The language of the examination is German or English at the student's choice.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 124	Design and Operation of Virtual Mobility Systems	Prof. Oliver Michler (oliver.michler@tu-dresden.de)
<b>Qualification aim</b>	Students have basic knowledge of the subject matter and objectives of virtual mobility systems, mobility aspects and mobility areas. Furthermore, the students have knowledge of the fundamentals of technical planning as well as procedures and solutions of mobility management in conventional and perspective systems as well as procedures and processes in network and quality management of connection-oriented and connectionless communication with industry and user-specific applications. They are able to plan, design and operate virtual mobility systems.	
<b>Content</b>	The content of the module is specific solutions for virtual mobility systems, their basic mode of operation and their integration into holistic systems. Design, operating scenarios and operating strategies based on defined operator and user profiles and the resulting system structures with interdisciplinary principles and methods play a key role.	
<b>Teaching and learning methods</b>	3 SWS lecture, 1 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	Knowledge of transport economics at bachelor level, as taught in the modules Mathematik für Wirtschaftswissenschaftler: Lineare Algebra, Mathematik für Wirtschaftswissenschaftler: Analysis, Statistik and Grundlagen Verkehrsingenieurwesen of the Bachelor's degree program in Verkehrswirtschaft, is required. The following literature is suitable for preparation: Sydsaeter, K.; Hammond, P.: Essential Mathematics for Economic Analysis, Financial Times Prentice Hall, Harlow, newest edition.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. If there are more than 5 registered students, the module examination consists of a written examination of 90 minutes duration. For up to 5 registered students, it consists of an oral examination of 30 minutes duration as an individual examination; if necessary, this will be announced to the registered students in writing at the end of the registration period. The examination language for both forms of examination is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	

<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 125	Transport Ecology	Prof. Jens Borcken-Kleefeld verkehrsoekologie@tu-dresden.de
<b>Qualification aim</b>	Students will be able to describe the effects of transport on the environment and recognize and classify dynamic effects/interactions. They are able to calculate fuel consumption and CO2 emissions for means of transport and to determine noise assessment levels for means of transport. Students will be able to present and evaluate arguments, terms and interdependencies in the context of internalization of external effects. They will be able to derive the appropriate delimitations for transport ecology issues.	
<b>Content</b>	The content of the module includes in particular energy, fuel consumption in transport, air pollutant loads, exhaust gas emissions, noise emissions, climate gas emissions from transport, environmental assessments, life cycle assessments and external effects.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS seminar, each in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 126	Methods of Transport Ecology	Prof. Jens Borcken-Kleefeld verkehrsoekologie@tu-dresden.de
<b>Qualification aim</b>	Students are able to comprehensively analyze and classify a traffic ecological task, to present the background and to develop and present problem-adequate solutions.	
<b>Content</b>	The module covers procedures that are used to incorporate and consider environmental aspects in the planning, construction, operation and dismantling of transport infrastructures.	
<b>Teaching and learning methods</b>	4 SWS seminar in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion in the extent of 75 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 127	Road Design	Prof. Reinhard Koettnitz (reinhard.koettnitz @tu-dres- den.de)
<b>Qualification aim</b>	Students acquire basic knowledge of vehicle dynamics and can quantify their influence on the elements of road design. In addition, the students acquire in-depth knowledge of the diverse interrelationships in the process of road planning and design with relevant boundary conditions (including economic efficiency, traffic safety, road service). Furthermore, they know the interfaces to surveying and other areas of traffic engineering. After completing the module, students will be able to understand the overall process for the geometric design of urban roads and junctions outside built-up areas and to assess the scope for discretionary planning.	
<b>Content</b>	Content of the module are: <ul style="list-style-type: none"> <li>- intersection design</li> <li>- Road surface design/drainage and</li> <li>- - vehicle restraint systems.</li> </ul>	
<b>Teaching and learning methods</b>	2 SWS lecture, 1 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. Preliminary work for the examination is a semester paper in the extent of 30 hours. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 128b	Special Problems in Traffic Flow Science	Prof. Karl Nachtigall (karl.nachtigall@tu-dresden.de)
<b>Qualification aim</b>	The students have the ability to analyze concrete optimization problems of land and air traffic and to model and solve them with selected methods of operation research including simulation as well as to correctly assess the efficiency of the treated methods on the respective problems and to adapt them to similar problems.	
<b>Content</b>	Content of the module are: <ul style="list-style-type: none"> <li>- Methods of operation research (linear programming, constraint propagation, artificial intelligence methods),</li> <li>- Traffic supply and demand modeling,</li> <li>- line and cycle scheduling,</li> <li>- Capacity management in land and air transport,</li> <li>- Special problems of air traffic flow management (ATFM) and</li> <li>- Fundamentals of Simulation.</li> </ul>	
<b>Teaching and learning methods</b>	5 SWS lecture, 5 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected. It provides the prerequisite for the module Special Problems in Traffic Flow Science and Logistic.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion in the extent of 30 hours and a written examination of 180 minutes duration. The seminar paper is relevant for passing. The examination language is German.	
<b>Credit points and grades</b>	15 credit points can be acquired through this module. The module grade results from the weighted average of the grades of the two examinations. The grade of the seminar paper is weighted once and the grade of the written examination is weighted four times.	
<b>Frequency of module</b>	The module is offered each academic year, beginning in the winter semester.	
<b>Workload</b>	The total workload is 450 hours.	
<b>Duration of the module</b>	The module lasts two semesters.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 129	Special Problems in Traffic Flow Science and Logistic	Prof. Karl Nachtigall (karl.nachtigall@tu-dresden.de)
<b>Qualification aim</b>	The students know and understand complex models as well as their computational implementation for the optimization of traffic and logistics processes (such as line planning, vehicle scheduling, duty scheduling, cycle time planning, approach control, air traffic flow control, route planning, procurement strategies), different methods of operation research (especially optimization) as well as the evaluation of existing practical program systems.	
<b>Content</b>	Content of the module are: <ul style="list-style-type: none"> <li>- current models and their extension for line planning, vehicle scheduling, duty scheduling, cycle time scheduling, approach control, air traffic flow control, route planning and procurement strategies in transportation.</li> <li>- contemporary solution methods of operation research as well as</li> <li>- selected evaluation methods of program systems.</li> </ul>	
<b>Teaching and learning methods</b>	1 SWS lecture, 2 SWS practical, 1 SWS seminar, each in german language and independent study.	
<b>Requirements for participation</b>	Competencies to be acquired in the Special Problems in Traffic Flows Science module are required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion in the extent of 30 hours. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 131a	Transport and Infrastructure Planning	Prof. Regine Gerike (regine.gerike@tu-dresden.de)
<b>Qualification aim</b>	Students will have an overview of the complex interrelationships of spatial and transport planning, their procedures and processes with integrated cooperative and consensus-oriented approaches. They are familiar with the tasks of the planning process and take into account the necessary integration aspects. The students know the interactions between regional planning, urban development planning and integrated transport development planning. They have the ability to analyze and forecast the traffic situation and to evaluate the effects of planned traffic infrastructure measures. They possess special knowledge of approaches to solving practical traffic planning tasks in the municipal area.	
<b>Content</b>	The contents of the module are in particular: <ul style="list-style-type: none"> <li>- Measures of transport development planning,</li> <li>- Objective and methodology of federal traffic route planning,</li> <li>- Urban land use planning and planning approval procedures,</li> <li>- Impact analyses and traffic planning evaluation procedures,</li> <li>- Collection of data on traffic behavior.</li> </ul>	
<b>Teaching and learning methods</b>	3 SWS lecture, 1 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. Preliminary work is a semester paper in the extent of 10 hours. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 132	Geodata Infrastructures	Prof. Lars Bernard (lars.bernard@tu-dresden.de)
<b>Qualification aim</b>	Students have comprehensive knowledge of current developments on spatial data infrastructures (GDI) and the fundamentals. They are able to design and develop geoinformation services, use them to publish geodata in GDIs, use and evaluate software tools and procedures to set up geoinformation services.	
<b>Content</b>	The content of the course is an overview of organizational and technical aspects of spatial data infrastructures (GDI), regulations and frameworks, and interoperability basics for geospatial information and related research.	
<b>Teaching and learning methods</b>	2 SWS lecture, 1 SWS practical and independent study.	
<b>Requirements for participation</b>	<p>Basic knowledge of geographic information systems at the undergraduate level is required.</p> <p>The following literature is suitable for preparation: Burrough, P. A. and R. A. McDonnel (2000): Principles of Geographical Information Systems. New York, Oxford University Press.</p> <p>de Smith, M., Goodchild, M., Longley D. (2008/2018): Geospatial Analysis.</p> <p>E-learning Plattform GITTA (Geographic Information Technology Training Alliance).</p> <p>Longley, P. A., Goodchild; M. F., Maguire; D. J., Rhind; D. W. (2005): Geographic Information Systems and Science (2nd ed.).</p> <p>Wiley, J.; Worboys S.; Michael, F.; Duckham, F. (2004) GIS: A Computing Perspective (2nd ed.) CRC Press.</p> <p>Learn ArcGIS: <a href="https://learn-arcgis-learnngis.hub.arcgis.com/">https://learn-arcgis-learnngis.hub.arcgis.com/</a></p>	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of an ungraded semester paper in the extent of 40 hours and a written examination of 90 minutes duration.	
<b>Credit points and grades</b>	5 credit points can be acquired through the module. The module grade results from the unweighted average of the grades of the individual examination performances, taking into account § 12 Paragraph 1 Sentence 5 Examination Regulations. If the semester paper is not passed, it will be graded with 5.0. In this case, the module grade results from the weighted average of the grades of the two examinations of the	

	module. The semester paper is weighted once and the written examination twice. If the semester paper is passed, the module grade corresponds to the grade of the written examination.
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 133	Basics in Psychology and Behavioural Economics	Dr. Jens Schade (jens.schade@tu-dresden.de)
<b>Qualification aim</b>	The students understand basic psychological relationships in the context of transport economic issues. They can apply initial psychological aspects to solve (behavioral) economic problems. They have a basic understanding of socially and scientifically relevant intersections between psychology and (behavioral) economics.	
<b>Content</b>	The module includes an overview of the major methods, theories, and research areas in psychology and behavioral economics.	
<b>Teaching and learning methods</b>	2 SWS seminar and independent study.	
<b>Requirements for participation</b>	Knowledge of transport economics at bachelor level, as taught in the module Grundlagen Verkehrsingenieurwesen of the bachelor's degree program in Verkehrswirtschaft, is required. The following literature is suitable for preparation: Gerrig, R. J., & Zimbardo, P. G. (2014): Psychologie. München: Pearson Studium. (englische Ausgabe), 20. Auflage.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected. It provides the prerequisite for the module Advanced Issues in Psychology and Behavioural Economics.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion in the extent of 100 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 134	Advanced Issues in Psychology and Behavioural Economics	Dr. Jens Schade (jens.schade@tu-dresden.de)
<b>Qualification aim</b>	The students have an extended understanding of psychological relationships in the context of transport economic issues. They are able to apply psychological theories and methods to solve complex (behavioral) economic problems. They have a deeper understanding of socially and scientifically relevant intersections between psychology and (behavioral) economics.	
<b>Content</b>	The module includes an overview of the major application areas and intervention strategies in psychology and behavioral economics.	
<b>Teaching and learning methods</b>	2 SWS seminar and independent study.	
<b>Requirements for participation</b>	Competencies to be acquired in the Basics in Psychology and Behavioural Economics module are required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion in the extent of 100 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 136	Electric Railways	Prof. Arnd Stephan (EBahnen@mailbox.tu-dresden.de)
<b>Qualification aim</b>	The students have special knowledge of the structure, function and design of power supply systems for electric vehicles for rail and road transport as well as the structure, function and design of electric vehicles. Based on this, the students are able to apply the procedures for the design and evaluation of railroad and transport power supply systems. Based on knowledge of the areas of application and the technical structure of the various energy supply systems, students are able to analyze energy supply systems for electrical traffic systems from an engineering point of view and to design and operate these systems. Furthermore, based on the knowledge of drive structures and main assemblies, they are able to determine the essential criteria for the design and operation of electric vehicles.	
<b>Content</b>	Infrastructure-specific contents of the module are common traction current systems with DC voltage and AC voltage, the structure and function of power supply systems (power generation, power transmission, power distribution, power supply, return current routing and grounding) and their design criteria. Further infrastructure-specific content includes safety-related, electrotechnical and operational requirements, in particular the problem areas of voltage maintenance, losses, short circuits, feeder lengths and substation clearances, overhead contact line protection, personal protection, energy and power demand calculation and thermal dimensioning. Vehicle-specific content of the module are drive structures and equipment of electric vehicles, driving dynamics, power, energy, the main vehicle components pantographs, high-voltage equipment, transformers, traction motors, power controls, on-board networks and auxiliary operations, mechanical drives, vehicle control technology, drive design as well as the control of three-phase drives.	
<b>Teaching and learning methods</b>	7 SWS lecture, 1 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of an oral examination as an individual examination of 60 minutes duration. If there are more than 20 registered students, the oral examination as an individual examination will be replaced by a written examination of 150 minutes duration;	

	if necessary, this will be announced to the registered students in writing at the end of the registration period. Preliminary work is the preparation of a semester paper in the extent of 30 hours. The examination language is German.
<b>Credit points and grades</b>	10 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.
<b>Frequency of module</b>	The module is offered each academic year, beginning in the winter semester.
<b>Workload</b>	The total workload is 300 hours.
<b>Duration of the module</b>	The module lasts two semesters.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 137	Electric Urban Transport Systems	Prof. Arnd Stephan (EBahnen@mailbox.tu-dresden.de)
<b>Qualification aim</b>	The students are familiar with the special features of the design and operation of efficient local transport systems for the realization of future mobility in urban and regional areas. Due to the complex approach of technical, traffic, operational and economic aspects based on interdisciplinary applied theoretical basic knowledge, the students are able to understand local transport in terms of system solutions. Furthermore, the students are able to assess the complex interactions of efficient local transport systems as part of the environmental relief in cities and their effects on daily life and thus to competently lead and enrich the social discourse on electromobility.	
<b>Content</b>	The module covers the definition and classification of mass transit systems, special designs (e.g. hybrid and low-floor technology), special features in the design of vehicles and energy supply, and modern energy storage systems. Further contents of the module are innovative systems of vehicle technology, control systems, modern traffic management as well as a differentiated consideration of the necessary infrastructure development for hybrid drive systems and the environmental balance of new technologies.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical, each in German language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of an oral examination as an individual examination of 30 minutes duration. If there are more than 15 registered students, the oral examination performance as an individual examination will be replaced by a written examination of 90 minutes duration; if necessary, this will be announced to the registered students in writing at the end of the registration period. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	

<b>Duration of the module</b>	The module lasts one semester.
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<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 138	Contact Lines	Prof. Arnd Stephan (EBahnen@mailbox.tu-dresden.de)
<b>Qualification aim</b>	The students know the requirements for the design of selected components of contact line systems. They will be familiar with design criteria and calculation algorithms derived specifically for overhead contact line systems in high-speed traffic and will be able to apply these to simple examples. Students will also be able to assess the effects of overhead contact line systems - for example, on the cityscape - and weigh up how to increase public acceptance for this necessary subsystem of electric transportation.	
<b>Content</b>	Content of the module are static and dynamic requirements, design fundamentals, continuity behavior, wind abrasion, equation of state, overhead contact lines for high speeds as well as design of conductor rail and overhead contact line systems..	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical, each in German language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of an oral examination as an individual examination of 30 minutes duration. If there are more than 15 registered students, the oral examination performance will be replaced by a written examination of 90 minutes duration; if necessary, this will be announced to the registered students in writing at the end of the registration period. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 139	Basic of Electrical Engineering for Transport Engineering	Prof. Arnd Stephan (EBahnen@mailbox.tu-dresden.de)
<b>Qualification aim</b>	The students have basic knowledge of electrical engineering and selected electrical machines. They are familiar with applications of electrical equipment in transport systems and the basic structure of national and railroad power supply systems and electric vehicles. The students are able to work independently on simple electrical engineering tasks and to discuss basic problems of electrical transport systems.	
<b>Content</b>	Contents of the module are basic electrotechnical variables, basic principles of electric and magnetic fields, electrical networks for direct and alternating current, three-phase alternating current systems, structure and function of electrical machines, applications of electrotechnical equipment in traffic engineering.	
<b>Teaching and learning methods</b>	3 SWS lecture, 1 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 147	Research seminar in transport ecology: "Data gathering methods in bicycle traffic"	Prof. Jens Borke-Kleefeld verkehrsoekologie@tu-dresden.de
<b>Qualification aim</b>	The students have in-depth knowledge of survey and evaluation methods in bicycle traffic and are familiar with related empirical questions. They are able to develop and present practical survey concepts in group work. The students have strengthened their social and communication skills through teamwork and are able to present and discuss results appropriately in written and spoken form.	
<b>Content</b>	Contents of the module are the current survey methods in bicycle traffic in the context of ecology-oriented planning topics.	
<b>Teaching and learning methods</b>	4 SWS seminar and independent study. The teaching language can be German or English and will be specifically determined by the lecturer at the beginning of each semester and announced as usual in the faculty.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion of the results in the extent of 70 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 148	Transport Network Optimization with Emerging Data for Ethical and Sustainable Applications	Prof. S. Travis Waller steven_travis.waller@tu-dresden.de
<b>Qualification aim</b>	Students will be able to use new data sources and network optimization methods such as routing algorithms, complex network mapping, and location and vehicle optimization in the context of metrics and constraints that explicitly consider ethical aspects of mobility.	
<b>Content</b>	<p>Contents of the module are:</p> <ul style="list-style-type: none"> <li>– fundamentals of transportation networks, network terminology, computational complexity, network optimization models and network optimization algorithms,</li> <li>– advanced concepts of network theory and related problems in transportation planning,</li> <li>– advanced variants of static and dynamic user equilibrium, complex network design problems, vehicle routing problems, and facility siting,</li> <li>– quantifiable approaches specific to network optimization for sustainability, equity, and environmental sustainability,</li> <li>– Quantifying equity and environmental justice as it relates to transportation,</li> <li>– modeling relevant system metrics within algorithmic approaches,</li> <li>– applications of the concepts to transportation planning problems such as network design problems, and</li> <li>– foundations of automated planning.</li> </ul>	
<b>Teaching and learning methods</b>	3 SWS lecture and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The competencies to be acquired in the modules Transport System Theory and Fundamentals of Integrated Transport Planning are assumed. The following literature is recommended for preparation: Ahuja, Ravindra K., Magnanti, Thomas L., Orlin, James B.: Network Flows: Theory, Algorithms, and Applications, Harlow: Person, current edition; Sheffi, Yosef: Urban Transportation Networks: Equilibrium Analysis with Mathematical Programming Methods, Englewood Cliffs, N. J.: Prentice-Hall, current edition.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion of the results in the extent of 70 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	

<b>Frequency of module</b>	The module is offered each academic year in the winter semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 213	Tactical ATM and CNS	Prof. Hartmut Fricke (hartmut.fricke@tu-dresden.de)
<b>Qualification aim</b>	The students master the procedures of radio, inertial and satellite navigation and understand technical navigation systems with their tasks, structure and mode of operation. They also understand the planning, organization and implementation of air traffic control and know about the necessary operational-technical systems for communication and monitoring of air traffic.	
<b>Content</b>	<p>Contents of the module are:</p> <ul style="list-style-type: none"> <li>- geodetic and cartographic basics,</li> <li>- Radio navigation/location system technology,</li> <li>- inertial navigation,</li> <li>- satellite navigation,</li> <li>- the principles of procedure design,</li> <li>- the principles of airspace utilization in relation to given capacities,</li> <li>- airport coordination procedures,</li> <li>- traffic flow control of network operations,</li> <li>- the tactical control measures of air traffic control as well as air traffic control operational services,</li> <li>- the organization and implementation of air traffic control and its future concepts, and</li> <li>- the airborne and ground-based systems and technologies of communication and surveillance.</li> </ul>	
<b>Teaching and learning methods</b>	6 SWS lecture, 1 SWS laboratory training and independent study. The teaching language of the lecture, practical and laboratory training can be German or English and will be specifically determined by the lecturer at the beginning of each semester and announced as usual in the faculty.	
<b>Requirements for participation</b>	Knowledge of transport economics at bachelor level is assumed. The following literature is suitable for preparation: Sydsaeter, K.; Hammond, P.: Essential Mathematics for Economic Analysis, Financial Times Prentice Hall, Harlow, latest edition; Frank W. Fischer: Active air traffic flow control, 1976; Clinton V. Oster, John S. Strong: Managing the skies, Ashgate, Aldershot, 2007; Detlef Schleicher: Digital VHF data link for air traffic control, Shaker, Aachen, 2000.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 240 minutes duration. The examination language is German or English, at the student's choice.	

<b>Credit points and grades</b>	9 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.
<b>Workload</b>	The total workload is 270 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 214	Aircraft Operations and Flight Planning	Prof. Hartmut Fricke (hartmut.fricke@tu-dresden.de)
<b>Qualification aim</b>	With the help of meteorological knowledge, students are able to develop and evaluate the essential documents for the safe, economical, punctual and regular flight operations of an airline. They know the flight operational tasks (Operating Procedures) and have a detailed command of the central elements of the cockpit equipment. In addition, students understand the structure and operation of fly-by-wire technology in aircraft as well as the possibilities of modern avionics for achieving economical and environmentally compatible flight operations.	
<b>Content</b>	<p>Contents of the module are:</p> <ul style="list-style-type: none"> <li>- the structure of the atmosphere,</li> <li>- the basic meteorological elements,</li> <li>- synoptic meteorology,</li> <li>- meteorological hazards,</li> <li>- aeronautical meteorological consulting and support,</li> <li>- problems of weather forecasting, and tasks and organization of flight operations services,</li> <li>- Flight preparation procedures (operational and ATC flight plan) and traffic flow control,</li> <li>- Navigation procedures/tasks and organization of flight operations services,</li> <li>- Crew Resource Management (CRM),</li> <li>- flight operations technology, and</li> <li>- cockpit equipment/avionics and their future developments.</li> </ul>	
<b>Teaching and learning methods</b>	4 SWS lecture, 1 SWS practical and independent study. The teaching language of the lecture, practical and laboratory training can be German or English and will be specifically determined by the lecturer at the beginning of each semester and announced as usual in the faculty.	
<b>Requirements for participation</b>	Knowledge of transport economics at bachelor level is assumed. The following literature is suitable for preparation: Donald J. Clausing: The aviator's guide to flight planning, Blue Ridge Summit, Pa.: TAB Books, 1989; Air Pilot's Manual - 4 Aeroplane - general knowledge : principles of flight, aircraft general, flight planning & performance, Shoreham Airport: Pooleys-Air Pilot Publ., 2014; N. Ashford, H. P. M. Stanton, C. A. Moore: Airport Operations, McGraw-Hill, New York, 2013; H. C. Wieske-Hartz: Airline Operation, NARA-Verlag, Allershausen, 2000.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	

<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a 90-minute written examination on the subject of cockpit technology and a 90-minute written examination on the subject of meteorological and planning flight preparation/execution. The examination language is German or English, at the student's choice.
<b>Credit points and grades</b>	6 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.
<b>Frequency of module</b>	The module is offered each academic year, beginning in the winter semester.
<b>Workload</b>	The total workload is 180 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VIW 222	Positioning and Vehicle Communications	Prof. Oliver Michler (oliver.michler@tu-dresden.de)
<b>Qualification aim</b>	Students master the methodological fundamentals of information technology concepts and systems, as well as the basic principles and procedures of positioning and navigation and their mode-specific applications. Furthermore, students can classify, specify and design information systems. They can apply systems for traffic data acquisition, transmission and processing in intelligent traffic systems, integrate positioning and communication systems and assess and evaluate selected mode-specific applications.	
<b>Content</b>	The module covers the fundamentals of traffic telematics information systems for the networking and localization of traffic participants as well as the practical application of such systems, taking into account the specific requirements of the various modes of transport. The theoretical content to be taught includes basic methods of positioning and navigation, especially satellite navigation systems and vehicle sensors, as well as the fundamentals of communication systems and their applications in intelligent traffic systems.	
<b>Teaching and learning methods</b>	3 SWS lecture, 1 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Transportation Engineering of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. For more than 15 registered students, the module examination consists of a written examination of 90 minutes duration. For up to 15 registered students, it consists of an oral examination as an individual examination of 30 minutes duration; if necessary, this will be announced to the registered students in writing at the end of the registration period. The language of the examination is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year, beginning in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts two semesters.	



<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-BWL 202	Supply Management	Prof. Dr. Rainer Lasch (rainer.lasch@tu-dresden.de)
<b>Qualification aim</b>	The students know and master the basics and instruments of the procurement management. They are able to apply the procedures in the field of supplier management, calculate material requirements in a program and consumption-oriented manner, use deterministic and stochastic inventory models and carry out an acceptance test as part of quality assurance.	
<b>Content</b>	Content of the module are the instruments of the procurement management, methods to the supplier management as well as stockkeeping models.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	Knowledge of Business Administration as taught in the modules-Grundlagen des Rechnungswesens, Einführung in die Betriebswirtschaftslehre und Organisation, Marketing und Nachhaltige Unternehmensführung, Jahresabschluss, Investition und Finanzierung and Produktion und Logistik of the Bachelor's degree program in Verkehrswirtschaft, is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Administration of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 120 minutes duration and a oral presentation in the extent of 45 minutes. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the weighted average of the grades of the two examination performances. The grade of the written examination is weighted 8.5 times and the grade of the oral presentation 1.5 times.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-BWL 203	Inventory Management	Prof. Dr. Udo Buscher (udo.buscher@tu-dresden.de)
<b>Qualification aim</b>	Students are familiar with the tasks and functions to be performed in the context of industrial inventory management. They are able to derive recommendations for the most efficient control of the flow of goods, taking into account the production and transfer processes.	
<b>Content</b>	Content of the module are: <ul style="list-style-type: none"> <li>- Tasks and functions within the framework of industrial inventory management</li> <li>- Production and transfer processes</li> <li>- control of the flow of goods and</li> <li>- cost-oriented inventory models.</li> </ul>	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study.	
<b>Requirements for participation</b>	Knowledge of Business Administration in production and logistics at the undergraduate level is required. The following literature is suitable for preparation: Heizer, J.; Render, B.; Munson, C.: Operations Management (2020): Sustainability and Supply Chain Management, 13th Edition, Pearson.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Administration of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. In the case of up to 3 registered students, it consists of an oral examination as an individual examination of 20 minutes duration; if necessary, this will be announced to the registered students in writing at the end of the registration period. The English-language assignment can also be completed in German, at the student's choice.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-BWL 204a	Power System Economics	Prof. Dr. Dominik Möst (dominik.moest@tu-dresden.de)
<b>Qualification aim</b>	The students know the basics and methods of the economic theory of the electricity sector. They are able to analyze the electricity sector from an economic perspective.	
<b>Content</b>	The content of the module is the basics and methods of the economic theory of the electricity sector.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical, 2 SWS seminar, each in german language and independent study.	
<b>Requirements for participation</b>	Knowledge as taught in the module Einführung in die Energiewirtschaft of the Bachelor's degree program in Verkehrswirtschaft is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Administration of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion of the results in the extent of 90 hours and a written examination of 90 minutes duration. In the case of up to 5 registered students, the examination consists of a seminar paper in the extent of 90 hours as well as an oral examination of 45 minutes duration; if necessary, this will be announced to the registered students in writing at the end of the registration period. The seminar paper is written in English; the examination language of the written examination is German.	
<b>Credit points and grades</b>	10 credit points can be acquired through this module. The module grade results from the weighted average of the grades of the examination performances. The grade of the examination performance I has the weight 2/3, the grade of the examination performance II has the weight 1/3.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 300 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-BWL 205	Financing with Venture Capital	Prof. Dr. Michael Schefczyk (michael.schefczyk@tu-dresden.de)
<b>Qualification aim</b>	The students know and understand the business model of venture capital financing of growth-oriented companies and the perspectives of investors, capital-seeking companies as well as advisory or regulatory institutions. They are able to make investment decisions and select building blocks for an investment contract.	
<b>Content</b>	The content of the module are: <ul style="list-style-type: none"> <li>- Business model of venture capital financing of growth-oriented companies</li> <li>- Perspectives of investors, capital seeking companies as well as advisory or regulating institutions.</li> </ul>	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS project, each in german language and independent study.	
<b>Requirements for participation</b>	Knowledge of Business Administration as taught in the modules Grundlagen der Betriebswirtschaftslehre und Organisation, Marketing und Nachhaltige Unternehmensführung and Jahresabschluss, Investition und Finanzierung of the Bachelor's degree program in Verkehrswirtschaft is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Administration of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a project work in the extent of 50 hours and a written examination of 90 minutes duration. The examination language of the project and written examination is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the unweighted average of the grades of the individual examination performances.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-BWL 208	Relationship-Marketing	Prof. Dr. Florian Siems (florian.siems@tu-dresden.de)
<b>Qualification aim</b>	Students will be able to explain the origins and objectives of relationship marketing. They know important theoretical basics of the subject and are able to classify and comprehend current scientific work in this field. They are also able to apply related analysis and management methods (especially in the field of customer satisfaction management).	
<b>Content</b>	Content of the module are the basics of relationship marketing as well as the application of analysis and management methods in relationship marketing.	
<b>Teaching and learning methods</b>	3 SWS lecture in german language and independent study.	
<b>Requirements for participation</b>	Knowledge of marketing at the bachelor's level or as taught in the Marketing Mix module of the bachelor's degree program in Verkehrswirtschaft is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Administration of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected. It provides the prerequisite for the module Marketing Research.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 60 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-BWL 210	Technology Management	Prof. Dr. Michael Schefczyk (michael.schefczyk@tu-dresden.de)
<b>Qualification aim</b>	The students master sound content knowledge of the fundamentals and possible applications in the field of technology management. They have the ability to apply the above-mentioned content knowledge to relevant practice-related issues in a situation-appropriate manner and are able to analyze complex issues from the areas of the fundamentals of technology management, property rights and market transactions as well as the internationalization of technologies, to develop solutions in a targeted manner and to implement these within the framework of the course.	
<b>Content</b>	Content of the module are: <ul style="list-style-type: none"> <li>- Basics and application possibilities in the field of technology management</li> <li>- basics of technology management, intellectual property rights and market transactions as well as</li> <li>- the internationalization of technologies.</li> </ul>	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS project and independent study. Participation in the seminar is limited to 50 participants in accordance with § 6 paragraph 9 of the study regulations.	
<b>Requirements for participation</b>	Knowledge of Business Administration and competencies to be acquired as taught in the modules Einführung in die Betriebswirtschaftslehre und Organisation, Marketing und Nachhaltige Unternehmensführung und Jahresabschluss, Investition und Finanzierung as well as basic knowledge of innovation and product management of the Bachelor's degree program in Verkehrswirtschaft are required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Administration of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a project work in the extent of 45 hours and a written examination of 60 minutes duration.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the unweighted average of the grades of the individual examination performances.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	



<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-BWL 211	Environment-Oriented Production Planning	Prof. Dr. Udo Buscher (udo.buscher@tu-dresden.de)
<b>Qualification aim</b>	Students will understand production systems as input-output systems that receive goods as input and deliver them in transformed form as output. Students will be able to model production economic facts with production functions, integrate environmentally relevant ancillary goods and uncover the cost and environmental effects of productions along the supply chain.	
<b>Content</b>	Content of the module is the modeling of production economic facts with production functions, input-output representation of production systems as well as environmentally relevant aspects in the supply chain.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	Knowledge of business management as taught in the module Produktion und Logistik of the Bachelor's degree program in Verkehrswirtschaft is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Administration of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. In the case of up to 3 registered students, it consists of an oral examination as an individual examination of 20 minutes duration; if necessary, this will be announced to the registered students in writing at the end of the registration period. The examination language for both forms of examination is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

Number of module	Name of module	Lecturer
VW-TEc-MA-BWL 212	Sustainability Management and Controlling	Prof. Dr. Edeltraud Günther (edeltraud.guenther@tu-dresden.de)
<b>Qualification aim</b>	After completing the module, students will be able to conduct sustainability analyses and integrate them into business decisions. The students are able to assess which instruments exist for monetary sustainability assessment and decision-making in the company, and which non-monetary sustainability instruments can be used. In addition, students will know how sustainability-oriented corporate strategies can be used to increase corporate value. In addition, students will be able to solve problems appropriately and to present their proposed solutions in written form.	
<b>Content</b>	The content of the module is sustainability analysis and sustainability controlling in companies.	
<b>Teaching and learning methods</b>	2 SWS lecture, 1 SWS tutorial and independent study. The language of the lecture and the tutorial can be German or English and will be specifically determined by the lecturer at the beginning of each semester and announced in the usual way by the faculty.	
<b>Requirements for participation</b>	<p>Knowledge of Business Administration at the undergraduate level is required.</p> <p>The following literature is suitable for preparation: Doan, H./Sassen, R. (2020): The relationship between environmental performance and environmental disclosure: A meta-analysis, in: Journal of Industrial Ecology, Vol. 24, S. 1140-1157.</p> <p>Sassen, R./Hinze, A.-K./Hardeck, I. (2016): Impact of ESG factors on firm risk in Europe, in: Journal of Business Economics, 86. Jg. S. 867-904.</p> <p>Egan, M. &amp; Tweedie, D. (2018): A "green" accountant is difficult to find: Can accountants contribute to sustainability management initiatives? Accounting, Auditing &amp; Accountability Journal, Vol. 31 Nr. 6, 1749-1773.</p> <p>Elkington, J. (2018, June 25): 25 Years Ago I Coined the Phrase "Triple Bottom Line." Here's Why It's Time to Rethink It. Harvard Business Review</p> <p>Global Reporting Initiative (GRI), &amp; RobecoSAM (2016). Defining What Matters. Do companies and investors agree on what is material?</p> <p>Guenther, E., Endrikat, J., &amp; Guenther, T. W. (2016): Environmental management control systems: A conceptualization and a review of the empirical evidence. Journal of Cleaner Production, 136(Part A), 147-171.</p> <p>Kieso, D. E.; K. (2015): Managerial accounting / Tools for business decision making.</p> <p>Wiley Holzer, H. P., [editor.]; Schoenfeld, Hanns M., [editor.] (2019): Managerial Accounting and Analysis in Multinational Enterprises, De Gruyter.</p>	

<b>Usability</b>	The module is a compulsory elective module in the field of Business Administration of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 60 minutes duration. The examination language is German.
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-BWL 213b	Ressource Management	Prof. Dr. Edeltraud Günther (edeltraud.guenther@tu-dresden.de)
<b>Qualification aim</b>	Students are able to identify and independently analyze entrepreneurial resources, especially with regard to the natural environment. Students are able to evaluate environmental resources with regard to environmentally relevant aspects and know how to integrate these into business decisions. The students know the instruments for ecology-oriented evaluation and decision-making in the company. They are able to use eco-logy-oriented corporate strategies to increase corporate value and environmental management systems for adequate resource management. In addition, students are able to work in teams, to solve problems independently and to present and defend their proposed solutions appropriately in written form and orally.	
<b>Content</b>	Contents of the module are the identification and evaluation of environmental resources of enterprises as well as environmental management in the enterprise, in particular instruments for the ecology-oriented evaluation and decision making, ecology-oriented enterprise strategies for the increase of enterprise value as well as the employment of environmental management systems for an adequate resource management.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS project and independent study. The teaching language of the lecture and the project can be German or English and will be specifically determined by the lecturer at the beginning of each semester and announced in the usual way by the faculty.	
<b>Requirements for participation</b>	Knowledge of Business Administration at the undergraduate level is required. The following literature is suitable for preparation: Whiteman, G., Walker, B., & Perego, P. (2013): Planetary boundaries: Ecological foundations for corporate sustainability. <i>Journal of management studies</i> , 50(2), 307-336. Stechemesser, K., & Guenther, E. (2012): Carbon accounting: a systematic literature review. <i>Journal of Cleaner Production</i> , 36, 17-38.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Administration of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a project work in the extent of 90 hours. The examination language is German.	

<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.
<b>Frequency of module</b>	The module is offered at irregular intervals, usually once per academic year.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-BWL 214	Managing People and Organizations	Prof. Dr. Blagoy Blagoev blagoy.blagoev@tu-dresden.de
<b>Qualification aim</b>	The students know and understand the central problem areas of the management of organizations and their members. They are able to make scientifically sound decisions and to reflect on the potential effects of these decisions in a broader context such as economic order, society or ethics.	
<b>Content</b>	Contents of the module are the essential theories and concepts of management and organizing on individual, group, formal-structural and informal-cultural levels.	
<b>Teaching and learning methods</b>	3 SWS seminar and independent study.	
<b>Requirements for participation</b>	<p>Knowledge of business administration at bachelor level is required. The following literature is suitable for preparation: Whiteman, G., Walker, B., &amp; Perego, P. (2013): Planetary boundaries: eco-logical foundations for corporate sustainability. <i>Journal of management studies</i>, 50(2), 307-336.</p> <p>Stechemesser, K., &amp; Guenther, E. (2012): Carbon accounting: a systematic literature review. <i>Journal of Cleaner Production</i>, 36, 17-38.</p> <p>The number of participants is limited to a maximum of 60 students. Selection will be based on the order of enrollment.</p>	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Administration of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 60 minutes duration and an oral examination of 30 minutes duration.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the weighted average of the two examination performances. The grade of the written exam is weighted three times and the grade of the oral examination is weighted twice.	
<b>Frequency of module</b>	The module is offered every academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-BWL 215	Corporate Sustainability	Prof. Dr. Samantha Dijkstra-Silva sustainability@tu-dresden.de
<b>Qualification aim</b>	Students will be able to create a presentation pitch for a successful company regarding its approach to corporate sustainability or corporate sustainability.	
<b>Content</b>	Contents of the module are basics of sustainability, global and corporate sustainability indicators as well as sustainability management, especially sustainability strategies and concepts for measuring, evaluating and reporting sustainability performance.	
<b>Teaching and learning methods</b>	2 SWS lecture and independent study. The teaching language of the lecture and the project can be German or English and will be specifically determined by the lecturer at the beginning of each semester and announced in the usual way by the faculty.	
<b>Requirements for participation</b>	As a prerequisite for the module, basic business knowledge in the areas of sustainable corporate management is recommended.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Administration of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a project work of 90 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered every academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VWL 302	Theory of Taxation	Prof. Dr. Marcel Thum (marcel.thum@tu-dresden.de)
<b>Qualification aim</b>	Students know the basic incentive and incidence effects of direct and indirect taxation. They are able to take a competent position on questions concerning the optimal design of tax systems and tax reforms.	
<b>Content</b>	Content of the module are incentive and incidence effects of direct and indirect taxation as well as optimal design of tax systems.	
<b>Teaching and learning methods</b>	2 SWS lecture, 1 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	<p>Knowledge of microeconomics and macroeconomics at the undergraduate level is required.</p> <p>The following literature is suitable for preparation: Varian, Hal R.: Intermediate microeconomics: a modern approach, Norton, New York, newest edition.</p> <p>Mankiw, N. G.: A quick refresher course in macroeconomics. National Bureau of Economic Research., newest edition.</p>	
<b>Usability</b>	The module is a compulsory elective module in the field of Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VWL 303	Theory of the Welfare State	Prof. Dr. Marcel Thum (marcel.thum@tu-dresden.de)
<b>Qualification aim</b>	Students will understand how social security systems work and their dependence on economic and demographic developments. They are able to competently discuss current reform proposals in the areas of health insurance, old-age and income security.	
<b>Content</b>	The content of the module is the functioning of social security systems as well as the influence of economic and demographic development on social security systems.	
<b>Teaching and learning methods</b>	2 SWS lecture, 1 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	Knowledge of microeconomics and macroeconomics at the undergraduate level is required. The following literature is suitable for preparation: Varian, Hal R.: Intermediate microeconomics: a modern approach, Norton, New York, newest edition. Mankiw, N. G.: A quick refresher course in macroeconomics. National Bureau of Economic Research., newest edition.	
<b>Usability</b>	The module is a compulsory elective module in the field of Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VWL 304	Resource Economics	Prof. Dr. Marcel Thum (marcel.thum@tu-dresden.de)
<b>Qualification aim</b>	Students will understand the economics of global resource markets. They are able to apply intermediate optimization methods to determine price and extraction paths in resource markets.	
<b>Content</b>	Content of the module are topics on resource economics, in particular the economic theory of optimal price and extraction paths.	
<b>Teaching and learning methods</b>	2 SWS lecture, 1 SWS practical and independent study.	
<b>Requirements for participation</b>	Knowledge of microeconomics and macroeconomics at the undergraduate level is required. The following literature is suitable for preparation: Varian, Hal R.: Intermediate microeconomics: a modern approach, Norton, New York, newest edition. Mankiw, N. G.: A quick refresher course in macroeconomics. National Bureau of Economic Research., newest edition.	
<b>Usability</b>	The module is a compulsory elective module in the field of Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered once every three academic years in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VWL 306	Economics of Migration	Prof. Dr. Alexander Kemnitz (alexander.kemnitz@tu-dresden.de)
<b>Qualification aim</b>	Students understand the motives and economic effects of the spatial mobility of individuals and households. They are able to take a critical stance on current migration policy issues and develop possible solutions.	
<b>Content</b>	Content of the module are economic approaches to explain migration.	
<b>Teaching and learning methods</b>	2 SWS lecture, 1 SWS practical, each in german language and independent study.	
<b>Requirements for participation</b>	Knowledge of microeconomics and macroeconomics at the undergraduate level is required. The following literature is suitable for preparation: Varian, Hal R.: Intermediate microeconomics: a modern approach, Norton, New York, newest edition. Mankiw, N. G.: A quick refresher course in macroeconomics. National Bureau of Economic Research., newest edition.	
<b>Usability</b>	The module is a compulsory elective module in the field of Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VWL 307	Economics of Education	Prof. Dr. Alexander Kemnitz (alexander.kemnitz@tu-dresden.de)
<b>Qualification aim</b>	The students know the determinants of individual educational decisions and state interventions in the education sector. They are able to critically examine and further develop current education policy reform proposals.	
<b>Content</b>	Contents of the module are economic approaches to explain education decisions and to analyze interventions in the education sector.	
<b>Teaching and learning methods</b>	2 SWS lecture, 1 SWS practical, each in German language and independent study.	
<b>Requirements for participation</b>	Basic knowledge of microeconomics and macroeconomics at the undergraduate level is required.	
<b>Usability</b>	The module examination consists of an examination paper of 90 minutes duration, a presentation of 15 hours duration and a two-part thesis paper. The examination language for the written examination, the presentation and the thesis paper is German.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module grade results from the weighted average of the individual examination performances. The grade of the exam paper is weighted sixteen times, the grade of the presentation three times and the grade of the thesis paper once.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VWL 308	Computable General Equilibrium Analysis	Prof. Dr. Artem Korzhenevych (artem.korzhenevych@tu-dresden.de)
<b>Qualification aim</b>	Students are familiar with the method of applied equilibrium modeling and understand its microeconomic and macroeconomic foundations. They are able to build simple models using the software GAMS and analyze the results. They are able to populate a CGE model with data, in particular to create a social accounting matrix from national accounts data. Students will be able to analyze different policies using CGE models. They are familiar with the scientific language English.	
<b>Content</b>	Content of the module are theoretical basics of numerical equilibrium analysis as well as programming and simulation of equilibrium models in GAMS. Furthermore, the module includes the creation of a social accounting matrix and a policy analysis using numerical equilibrium analysis.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical and independent study. Participation in the practical is limited to 20 participants in accordance with § 6 paragraph 9 of the study regulations.	
<b>Requirements for participation</b>	Knowledge of microeconomics and macroeconomics at the undergraduate level is required. The following literature is suitable for preparation: Varian, Hal R.: Intermediate microeconomics: a modern approach, Norton, New York, newest edition. Mankiw, N. G.: A quick refresher course in macroeconomics. National Bureau of Economic Research., newest edition.	
<b>Usability</b>	The module is a compulsory elective module in the field of Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of an oral examination as a individual examination of 20 minutes duration.	
<b>Credit points and grades</b>	10 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 300 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VWL 310	Exchange Rates	Prof. Dr. Stefan Eichler (stefan.eichler@tu-dresden.de)
<b>Qualification aim</b>	Students are familiar with the analysis of foreign exchange markets. They know theoretical and empirical issues of interest rate and purchasing power parity and understand the short- and long-term dynamics of exchange rates. They are able to comment competently on the development of foreign exchange markets and their institutional design.	
<b>Content</b>	The content of the module is economic models of foreign exchange markets and their application.	
<b>Teaching and learning methods</b>	2 SWS lecture and independent study.	
<b>Requirements for participation</b>	Knowledge of microeconomics and macroeconomics at the undergraduate level is required. The following literature is suitable for preparation: Varian, Hal R.: Intermediate microeconomics: a modern approach, Norton, New York, newest edition. Mankiw, N.: Macroeconomics 10th edition.	
<b>Usability</b>	The module is a compulsory elective module in the field of Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 60 minutes duration.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VWL 313	Financial Stability and Regulation of Financial Markets	Prof. Dr. Thilo Liebig thilo.liebig@bundesbank.de
<b>Qualification aim</b>	Students will be familiar with the problem of systemic risk and its impact on financial market stability. They understand the essential tasks, institutions and instruments of banking, insurance, securities and macroprudential supervision at national and international level. They are able to analyze the causes and effects of financial crises in a well-founded manner and to discuss suitable regulatory mechanisms.	
<b>Content</b>	Content of the module are basic topics of financial market stability, causes and effects of financial crises as well as banking, insurance, securities and macroprudential supervision on national and international level.	
<b>Teaching and learning methods</b>	2 SWS lecture in german language and independent study.	
<b>Requirements for participation</b>	Knowledge of microeconomics at the undergraduate level is required. The following literature is suitable for preparation: Varian, Hal R.: Intermediate microeconomics: a modern approach, Norton, New York, newest edition.	
<b>Usability</b>	The module is a compulsory elective module in the field of Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VWL 315	Development Economics	Prof. Dr. Christian Leßmann christian.lessmann@tu-dresden.de
<b>Qualification aim</b>	The students know relevant models of modern growth theory as well as models of comparative development research. With the help of these models, they are able to explain the causes of intra- and international income differences. Furthermore, they are able to analyze and interpret the effects of population changes, fertility and migration.	
<b>Content</b>	Contents of the module are: <ul style="list-style-type: none"> <li>- traditional and alternative explanations of growth and development, and</li> <li>- inequality, population growth and migration as determinants of development.</li> </ul>	
<b>Teaching and learning methods</b>	2 SWS lecture, 1 SWS practical and independent study.	
<b>Requirements for participation</b>	Basic knowledge of microeconomics and macroeconomics at the undergraduate level is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. The English-language assignment can be edited in English or German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VWL 316	Empirical Economics	Prof. Dr. Christian Leßmann christian.lessmann@tu-dresden.de
<b>Qualification aim</b>	Students are familiar with the application of modern empirical methods in economics. They are able to apply them independently.	
<b>Content</b>	Contents of the module are: - Fundamentals and methods of empirical economic research and - the application of statistical software.	
<b>Teaching and learning methods</b>	2 SWS lecture, 1 SWS practical and independent study.	
<b>Requirements for participation</b>	Prerequisite knowledge of mathematics and statistics at basic course baccalaureate level.	
<b>Usability</b>	The module is a compulsory elective module in the field of Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written test of 60 minutes duration as well as homework and exercises of 24 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the arithmetic mean of the grade of the written exam and the grade of the homework and exercises. The English-language assignment can also be worked on in German.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VWL 317	Microeconomic Perspectives on Development Economics	Jun.-Prof. Dr. Valentin Lindlacher valentin.lindlacher@tu-dresden.de
<b>Qualification aim</b>	After completing the module, students will be familiar with relevant topics and models of modern development economics as well as models of comparative development research. They are able to understand the role of different factors, especially health, education and private wealth, on the development of individuals and to critically consider resulting policy measures.	
<b>Content</b>	Contents of the module are the role of different types of capital, in particular human, physical, financial and social capital, coordination failures, models of asymmetric information, up to simple behavioral models and specific policy measures.	
<b>Teaching and learning methods</b>	2 SWS lecture, 1 SWS practical and independent study.	
<b>Requirements for participation</b>	Knowledge of microeconomics, macroeconomics and econometrics at undergraduate level is assumed. Econometrics at bachelor level are assumed.	
<b>Usability</b>	The module is a compulsory elective module in the field of Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written test of 90 minutes duration.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VWL 318	Introduction to Geographic Information Systems	Jun.-Prof. Dr. Valentin Lindlacher valentin.lindlacher@tu-dresden.de
<b>Qualification aim</b>	After completing the module, students will be familiar with the application of Geographic Information Systems software in economics. They are able to use it independently, for example in a final thesis.	
<b>Content</b>	Contents of the module are the characteristics and application areas of Geographic Information Systems.	
<b>Teaching and learning methods</b>	2 SWS lecture, 1 SWS practical and independent study.	
<b>Requirements for participation</b>	Basic programming/EDP skills at a bachelor's level are required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written test of 90 minutes duration as well as homework and exercises of 15 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the weighted average of the grades of the examination performances. The grade of the written exam has the weight 3/5, the grade of the homework and exercises has the weight 2/5.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-VWL 319	Current Topics in Empirical Economic Research	Jun.-Prof. Dr. Valentin Lindlacher valentin.lindlacher@tu-dresden.de
<b>Qualification aim</b>	Students are able to analyze quantitative, research-oriented literature in economics. They are able to use this knowledge independently in the following modules of the study program, especially in the conception of the final thesis.	
<b>Content</b>	Contents of the module are current issues of empirical economic research and basic methods of application-oriented research.	
<b>Teaching and learning methods</b>	2 SWS seminar and independent study. The number of participants is limited to a maximum of 20 students. Selection will be based on the order of enrollment.	
<b>Requirements for participation</b>	Knowledge of microeconomics, macroeconomics and econometrics at undergraduate level is assumed. Econometrics at bachelor level are assumed.	
<b>Usability</b>	The module is a compulsory elective module in the field of Economics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a seminar paper including presentation and discussion in the extent of 25 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-WIF 404	ERP-supported Business Processes	Prof. Dr. Susanne Strahinger (susanne.strahinger@tu-dresden.de)
<b>Qualification aim</b>	Students possess skills in the practical use of ERP systems and can apply them in selected business processes. They also have an understanding of the concrete design of operational application systems in a selection of specific industries and company types, so that they can make well-founded assessments of the suitability of systems and the necessary system- and process-related design requirements in simple operational contexts in the context of the business processes covered. In addition, they can explain the connection between IT management tasks and operational implementation using examples and possess in-depth practical project management skills as well as their skills in the area of teamwork and (self-)organization.	
<b>Content</b>	The content of the module is an in-depth examination of operational business processes, which are typically supported by enterprise resource planning (ERP) systems.	
<b>Teaching and learning methods</b>	3 SWS project in German language and independent study. Participation in the project is limited to 28 participants in accordance with § 6 paragraph 9 of the study regulations.	
<b>Requirements for participation</b>	The competencies to be acquired in the modules IT-Management and IT-Architecture and Basic Principles of Information Systems are required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Informatics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a project work in the extent of 60 hours. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered at irregular intervals.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-WIF 405	IT-Management and IT-Architecture	Prof. Dr. Susanne Strahringer (susanne.strahringer@tu-dresden.de)
<b>Qualification aim</b>	Students understand the scope of application and the potentials that arise in the design of complex IT landscapes. They also recognize the extent to which architecture and business process management as well as modeling can make a valuable contribution in the design of companies or company divisions. They apply common modeling methods and tools for describing business processes and enterprise architectures and can evaluate in which situations their use is appropriate.	
<b>Content</b>	Content of the module are tasks of strategic IT management and in particular basic enterprise architecture concepts.	
<b>Teaching and learning methods</b>	2 SWS lecture, 1 SWS practical, each in german language and independent study. Participation in the practical is limited to 70 participants in accordance with § 6 paragraph 9 of the study regulations.	
<b>Requirements for participation</b>	Basic knowledge of IT-Management and IT-Architecture at bachelor's level is required, in particular the organizational structure and workflow of a company (common structures and processes) as well as a basic understanding of the benefits of IT in a company. Basic knowledge of Business Administration and business informatics at undergraduate level is also required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Informatics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected. It provides the prerequisite for the module ERP-supported Business Processes.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. For up to 15 registered students, it consists of an oral examination as an individual examination of 20 minutes; if necessary, this will be announced to the registered students in writing at the end of the registration period. The examination language for the written examination or the oral examination is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	

<b>Duration of the module</b>	The module lasts one semester.
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<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-WIF 406	Corporate Communications	Prof. Dr. Eric Schoop (eric.schoop@tu-dresden.de)
<b>Qualification aim</b>	Students will be familiar with the economic, information technology and communication science framework conditions of successful corporate communication. They are able to work out application-specific rationalization and quality requirements in their economic, communicative and information technology dimensions and to design an efficient information infrastructure for information processing and exchange on the basis of basic information engineering methods.	
<b>Content</b>	Contents of the module are basic approaches to corporate communication.	
<b>Teaching and learning methods</b>	1 SWS lecture, 1 SWS practical, 1 SWS tutorial, 1 SWS seminar and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Informatics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of an oral examination as a group examination with duration of 15 minutes per participant as well as an ungraded homework and exercise assignment of 20 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through the module. The module grade results from the weighted average of the grades of the individual examination performances, taking into account § 12 Paragraph 1 Sentence 5 Examination Regulations. If the homework and exercise assignments is not passed, it will be graded with 5.0. In this case, the module grade results from the weighted average of the grades of the two examinations of the module. The oral examination is weighted once and the homework and practical assignment three times. If the homework and practical assignment is passed, the module grade corresponds to the grade of the oral examination.	
<b>Frequency of module</b>	The module is offered each academic year in the winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-WIF 407	Knowledge Management	Prof. Dr. Eric Schoop (eric.schoop@tu-dresden.de)
<b>Qualification aim</b>	Students are familiar with the economic, organizational and information technology interrelationships of knowledge management in organizations, in particular automation aspects for supporting social interaction processes in knowledge management and for codifying knowledge. They are able to evaluate and apply the necessary models and methods of information management with regard to the construction of knowledge management systems.	
<b>Content</b>	Contents of the module are basics of knowledge management in companies.	
<b>Teaching and learning methods</b>	1 SWS lecture, 1 SWS practical, 1 SWS tutorial, 1 SWS seminar and independent study.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Informatics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of an oral examination as a group examination with duration of 15 minutes per participant and an ungraded homework and exercise assignment of 20 hours.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the weighted average of the grades of the individual examination performances, taking into account § 12 Paragraph 1 Sentence 5 Examination Regulations. If the homework and exercise assignment is not passed, it is included in the grade with the grade 5.0. In this case, the module grade results from the weighted average of the grades of the two examination performances of the module. The grade of the oral examination performance is weighted once and that of the homework and exercise assignments three times. If the homework and exercise assignments are passed, the module grade corresponds to the grade of the oral examination performance.	
<b>Frequency of module</b>	The module is offered each academic year in the summer semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-WIF 408	Basic Principles of Information Systems	Prof. Dr. Susanne Strahinger (susanne.strahinger@tu-dresden.de)
<b>Qualification aim</b>	Students know how business application systems work, especially enterprise resource planning systems. They understand the basic implementation process of such systems, divided into the sub-processes of system selection, implementation and adaptation, and can apply some techniques that support this process.	
<b>Content</b>	The content of the module is enterprise resource planning systems and their implementation in companies.	
<b>Teaching and learning methods</b>	2 SWS lecture, 2 SWS practical, each in german language and independent study. Participation in the practical is limited to 90 participants in the winter semester and 45 participants in the summer semester in accordance with § 6 paragraph 9 of the study regulations.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Informatics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected. It provides the prerequisite for the module ERP-supported Business Processes.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration. The examination language is German.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade corresponds to the grade of the examination performance.	
<b>Frequency of module</b>	The module is offered every semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-WIF 410b	Digital Business Engineering	Prof. Dr. Martin Wiener martin.wiener@tu-dresden.de
<b>Qualification aim</b>	After completing the module, students are familiar with the main approaches and issues of digital business engineering and know the central levels and fundamental principles for the method-based design of organizational change projects. They will also be able to apply selected methods and techniques of digital business engineering in projects.	
<b>Content</b>	The content of the module is the systematic design of the digital transformation of organizations in business and administration.	
<b>Teaching and learning methods</b>	1 SWS lecture, 2 SWS project and independent study. The number of participants is limited to a maximum of 20 students. Selection is based on the order of enrollment.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the field of Business Informatics of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected. It provides the prerequisite for the module ERP-supported Business Processes.	
<b>Requirements for the award of credits</b>	The credit points are acquired when the module examination is passed. The module examination consists of a written examination lasting 60 minutes (examination performance I) and a project work lasting 45 hours (examination performance II). If there are less than 10 registered students, the examination performance I consists of an oral examination performance as a group examination of 20 minutes per candidate; if necessary, this will be announced to the registered students in writing at the end of the registration period.	
<b>Credit points and grades</b>	5 credit points can be acquired through the module. The module grade results from the weighted average of the grades of the examination performances. The grade of the examination performance I has a weight of 3/4 and the grade of the examination performance II has a weight of 1/4.	
<b>Frequency of module</b>	The module is offered every winter semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

Number of module	Name of module	Lecturer
VW-TEc-MA-FFK 501	Elementary Level Foreign Language (CEFR A2)	Ute Meyer sz.ausbildung-pruefung@tu-dresden.de
<b>Qualification aim</b>	Students possess basic communicative competence in a foreign language of their choice at level A2.1 of the Common European Framework of Reference for Languages. This includes basic knowledge of phonetics, lexis, grammar and syntax that can be developed, as well as basic skills in reading and listening comprehension, speaking, writing and in the intercultural field. Students are able to handle important, simple communication situations in the foreign language at an elementary level.	
<b>Content</b>	<p>Contents of the module are in a foreign language of the student's choice:</p> <ul style="list-style-type: none"> <li>- Basic vocabulary concerning origin, education, everyday situations, university</li> <li>- basic grammar</li> <li>- elementary oral communication in everyday situations and in the university environment</li> <li>- relevant reading and listening strategies</li> <li>- basics of written communication.</li> </ul>	
<b>Teaching and learning methods</b>	4 SWS language course and independent study. The languages that can be selected are Arabic, Chinese, Czech, Finnish, French, German as a foreign language, Italian, Japanese, Polish, Portuguese, Russian, Spanish and Swedish.	
<b>Requirements for participation</b>	Knowledge of the chosen language at level A1+ of the Common European Framework of Reference for Languages is required, as can be acquired in the course E1+2. If necessary, the language level can be proven by a placement test.	
<b>Usability</b>	The module is a compulsory elective module in the area of Foreign Language Communication, of which modules worth a maximum of 10 credit points can be selected from the module group Supplements in the master's program Transportation Economics, of which modules worth 30 credit points must be selected. The module cannot be selected in the master's program Transportation Economics if the same language has already been completed in the bachelor's program Verkehrswirtschaft. It provides competencies that are required for other specialization modules language and lead to the acquisition of language certificates (UNICert® level Basis in the following languages: French, Italian, Portuguese, Swedish, Spanish).	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration and an oral examination as an individual or group examination of 15 minutes duration, both of which must be evaluated	

	with at least "sufficient" (4.0) according to § 14 paragraph 1 of the examination regulations.
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the weighted average of the grades of the two examination performances. The written examination is weighted twice and the oral examination is weighted once.
<b>Frequency of module</b>	The module is offered every semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-FFK 502	Advanced Elementary Level Foreign Language (CEFR A2+)	Ute Meyer sz.ausbildung-pruefung@tu-dresden.de
<b>Qualification aim</b>	Students possess elementary communicative language competence in a foreign language of their choice at level A2+ of the Common European Framework of Reference for Languages. Students demonstrate well-developed basic communicative as well as grammatical skills in a foreign language of their choice. They are able to communicate in simple routine situations without excessive effort and have mastered essential written forms of communication from everyday life and studies.	
<b>Content</b>	<p>Contents of the module are in a foreign language of the student's choice:</p> <ul style="list-style-type: none"> <li>- lexis and grammar</li> <li>- strategies for reading and listening comprehension</li> <li>- understand short texts such as e-mails and letters from friends or colleagues</li> <li>- communicate in simple routine situations from everyday life and studies</li> <li>- express and justify own opinions in a simple way</li> <li>- describe events in an elementary way, describe past actions and personal experiences.</li> </ul>	
<b>Teaching and learning methods</b>	4 SWS language course and independent study. The languages that can be selected are Arabic, Chinese, Czech, French, German as a foreign language, Italian, Japanese, Polish, Portuguese, Spanish and Swedish.	
<b>Requirements for participation</b>	Language skills of the chosen language at level A2 of the Common European Framework of Reference for Languages are required, as they can be acquired in the Elementary Level Foreign Language module. If necessary, the language level can be proven by a placement test.	
<b>Usability</b>	The module is a compulsory elective module in the area of Foreign Language Communication, of which modules worth a maximum of 10 credit points can be selected from the module group Supplements in the master's program Transportation Economics, of which modules worth 30 credit points can be selected. The module cannot be selected in the master's program Transportation Economics if the same language has already been completed in the bachelor's program Verkehrswirtschaft. It creates requirements for the acquisition of language certificates (TU certificate elementary level or UNICert® level basic in the following languages: Chinese, Japanese, Polish, Czech).	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration (150 minutes duration in CHI and JAP) and an oral	

	examination performance as an individual or group examination of 15 minutes duration, both of which must be graded at least "sufficient" (4.0) according to § 14 paragraph 1 Examination Regulations.
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the weighted average of the grades of the two examination performances. The written examination is weighted twice and the oral examination is weighted once.
<b>Frequency of module</b>	The module is offered every semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-FFK 503	Extension Module Intermediate Level Foreign Language (CEFR B1)	Ute Meyer sz.ausbildung-pruefung@tu-dresden.de
<b>Qualification aim</b>	Students possess advanced basic communicative competence in a foreign language of their choice at level B1.1 of the Common European Framework of Reference for Languages. Students are proficient in written and oral communication in standard situations. They are able to handle essential written forms of communication and conversational situations from everyday life and studies. In addition, they are prepared for a study stay or an internship abroad.	
<b>Content</b>	Contents of the module are in a foreign language of the student's choice: <ul style="list-style-type: none"> <li>- lexis and grammar</li> <li>- reading and listening comprehension based on selected texts of varying length and complexity</li> <li>- oral communication techniques including summarizing and formulating evaluative and argumentative statements</li> <li>- Describing facts, writing simple official documents.</li> </ul>	
<b>Teaching and learning methods</b>	4 SWS language course and independent study. The languages Chinese, German as a foreign language, French, Italian, Russian, Swedish and Spanish can be selected.	
<b>Requirements for participation</b>	Language skills in the chosen language at level A2+ of the Common European Framework of Reference for Languages are required, as they can be acquired in the module Advanced Foreign Language. If necessary, the language level can be proven by a placement test.	
<b>Usability</b>	The module is a compulsory elective module in the area of Foreign Language Communication, of which modules worth a maximum of 10 credit points can be selected from the module group Supplements in the master's program Transportation Economics, of which modules worth 30 credit points must be selected. The module cannot be selected in the master's program Transportation Economics if the same language has already been completed in the bachelor's program Verkehrswirtschaft. It provides competences that are required for the acquisition of the language certificate UNICert® Level I in French, Italian, Swedish and Spanish (UNICert® Level I in Russian after M3).	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration and an oral examination performance as an individual or group examination of 15 minutes duration, both of which must be evaluated with at least "sufficient" (4.0) according to § 14 paragraph 1 examination regulations.	
<b>Credit points and</b>	5 credit points can be acquired through this module. The module	

<b>grades</b>	grade results from the weighted average of the grades of the two examination performances. The written examination is weighted twice and the oral examination is weighted once.
<b>Frequency of module</b>	The module is offered every semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-FFK 504	Extension Module Intermediate Level Foreign Language (CEFR B1+)	Ute Meyer sz.ausbildung-pruefung@tu-dresden.de
<b>Qualification aim</b>	Students will have productive and receptive competencies in a foreign language of their choice at the B1+ level of the Common European Framework of Reference for Languages. Students will be able to use communicative strategies to carry on conversations about the future and the past. They are able to understand the main points in standard situations when clear standard language is used. They acquire general language skills in an action-oriented and high school-specific learning context. They will be able to cope with a study or internship abroad.	
<b>Content</b>	<p>Contents of the module are in a foreign language of the student's choice:</p> <ul style="list-style-type: none"> <li>- consolidation of lexis and grammar</li> <li>- Expansion of basic vocabulary</li> <li>- comprehension of longer utterances, if the topic is known</li> <li>- participate actively in discussions in familiar situations, justify and defend one's own views</li> <li>- compose longer authentic texts for university and study-related situations</li> </ul>	
<b>Teaching and learning methods</b>	4 SWS language course and independent study. The languages Chinese, German as a foreign language, French and Spanish can be selected.	
<b>Requirements for participation</b>	Language skills of the chosen language at level B1 of the Common European Framework of Reference for Languages are required, as they can be acquired in the module Extension Module Intermediate Foreign Language Level CEFR B1. If necessary, the language level can be proven by a placement test.	
<b>Usability</b>	The module is a compulsory elective module in the area of Foreign Language Communication, of which modules worth a maximum of 10 credit points can be selected from the module group Supplements in the master's program Transportation Economics, of which modules worth 30 credit points must be selected. The module cannot be selected in the master's program Transportation Economics if the same language has already been completed in the bachelor's program Verkehrswirtschaft. It provides competencies that are prerequisites for other language specialization modules. In Chinese, the language certificate UNlcert® Level I can be acquired.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration (150 minutes duration in CHI) and an oral examination performance as a group or individual examination of 15 minutes	

	duration, both of which must be graded at least "sufficient" (4.0) according to § 14 paragraph 1 Examination Regulations.
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the weighted average of the grades of the two examination performances. The written examination is weighted twice and the oral examination is weighted once.
<b>Frequency of module</b>	Da The module is offered every semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one semester.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-FFK 505a	Introduction to Professional and Academic Language: Working with Texts and Oral Communication (CEFR B2+)	Ute Meyer sz.ausbildung-pruefung@tu-dresden.de
<b>Qualification aim</b>	Students possess the ability to communicate independently in a foreign language of their choice, both in writing and orally, at level B2+ of the Common European Framework of Reference for Languages. This includes the comprehension of complex science-, subject- and profession-related texts. Students can express themselves clearly, in detail and fluently in writing and orally using complex linguistic structures (such as explaining and arguing) and an extensive general as well as limited specialized vocabulary on selected topics in their field in international contexts. They have mastered relevant communication techniques and also possess intercultural competence.	
<b>Content</b>	Contents of the module are in a foreign language of the student's choice: <ul style="list-style-type: none"> <li>- Introduction to the language of science</li> <li>- reading and listening strategies</li> <li>- subject- and science-related text work and technical discussions on the topic of studies and profession</li> <li>- media for (autonomous) language acquisition</li> <li>- subject-related oral presentations</li> </ul>	
<b>Teaching and learning methods</b>	4 SWS language course and independent study. The languages German as a foreign language, French, Russian, Spanish are selectable.	
<b>Requirements for participation</b>	Language skills of the chosen language at level B2 of the Common European Framework of Reference for Languages are required. If the corresponding entry level is not available, preparation can take place through participation in reactivation courses and through (media-supported) self-study, if necessary after personal consultation.	
<b>Usability</b>	The module is a compulsory elective module in the area of Foreign Language Communication, of which modules worth a maximum of 10 credit points can be selected from the module group Supplements in the master's program Transportation Economics, of which modules worth 30 credit points must be selected. The module cannot be selected in the master's program Transportation Economics if the same language has already been completed in the bachelor's program Verkehrswirtschaft. It provides competencies that are required for participation in certificate courses (TU certificate, UNICert® Level II in French, Russian and Spanish) and other in-depth or supplementary modules.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90	

	minutes duration and a oral presentation in the extent of 30 hours.
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the weighted average of the grades of the two examination performances. The written examination is weighted twice and the oral presentation is weighted once.
<b>Frequency of module</b>	The module is offered every semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one to two semesters depending on the choice of the students.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-FFK 506a	Introduction to Professional and Academic Language: Written Communication and Application Training plus one Profile Course (CEFR B2+)	Ute Meyer sz.ausbildung-pruefung@tu-dresden.de
<b>Qualification aim</b>	The module aims to enable students to become proficient in the target language and culture, especially in academic and professional contexts. Course participants master academic writing techniques and also possess intercultural competence. Foreign language competence in the above areas corresponds to level B2+ of the Common European Framework of Reference for Languages.	
<b>Content</b>	Contents of the module are in a foreign language of the student's choice: <ul style="list-style-type: none"> <li>- techniques of scientific writing</li> <li>- subject- and culture-related communication</li> <li>- Application training including the writing of a curriculum vitae.</li> </ul>	
<b>Teaching and learning methods</b>	4 SWS language course and independent study. The courses are to be selected from the module's catalog of offerings; this catalog, including the respective required examination performances and weights as well as combination restrictions, is announced at the beginning of the semester in the usual manner of the faculty. The languages German as a foreign language, French, Russian and Spanish can be selected.	
<b>Requirements for participation</b>	Language skills of the chosen language at level B2 of the Common European Framework of Reference for Languages are required. If necessary, the language level can be proven by a placement test.	
<b>Usability</b>	The module is a compulsory elective module in the area of Foreign Language Communication, of which modules worth a maximum of 10 credit points can be selected from the module group Supplements in the master's program Transportation Economics, of which modules worth 30 credit points must be selected. The module cannot be selected in the master's program Transportation Economics if the same language has already been completed in the bachelor's program Verkehrswirtschaft.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration and an oral examination performance as a group or individual examination of 30 minutes duration, both of which must be graded at least "sufficient" (4.0) according to § 14 paragraph 1 Examination Regulations.	
<b>Credit points and</b>	5 credit points can be acquired through this module. The module	

<b>grades</b>	grade results from the unweighted average of the grades of the individual examination performances.
<b>Frequency of module</b>	The module is offered every semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one to two semesters depending on the choice of the students.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-FFK 507	Professional Competencies in a Foreign Language (CEFR C1/C2)	Ute Meyer sz.ausbildung-pruefung@tu-dresden.de
<b>Qualification aim</b>	The students possess profound skills in the field of professional and scientific communication in a foreign language to be chosen. They have in-depth intercultural competence and are able to use this knowledge flexibly and competently in the context of studying abroad and in a professional context.	
<b>Content</b>	The content of the module is the learning of a foreign language for general, professional and scientific communication.	
<b>Teaching and learning methods</b>	4 SWS language course according to the catalog of profile courses of language education at the TU Dresden and independent study. The languages German as a foreign language, English, French and Spanish can be selected.	
<b>Requirements for participation</b>	<p>General language knowledge and skills in the chosen foreign language as developed in the modules:</p> <ul style="list-style-type: none"> <li>- Introduction to professional and scientific language: text work and oral communication (CEFR B2+).</li> <li>- Introduction to professional and scientific language: written communication and job application training plus one profile course (CEFR B2+)</li> <li>- Introduction to Professional and Scientific Language: Advanced Text Work and Oral Communication (CEFR C1) and</li> <li>- Introduction to professional and scientific language: written communication and job application training plus one advanced profile course (CEFR C1</li> </ul> <p>or comparable knowledge, which may have to be proven by a placement test.</p>	
<b>Usability</b>	The module is a compulsory elective module in the area of Foreign Language Communication, of which modules worth a maximum of 10 credit points can be selected from the module group Supplements in the master's program Transportation Economics, of which modules worth 30 credit points must be selected. The module cannot be selected in the master's program Transportation Economics if the same language has already been completed in the bachelor's program Verkehrswirtschaft. It requires the acquisition of the language certificates ABE and APE (English) as well as UNICert® Level III (French and Spanish).	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration and an oral examination performance as a group or individual examination of 30 minutes duration, both of which must be	

	graded at least "sufficient" (4.0) according to § 14 paragraph 1 Examination Regulations.
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the unweighted average of the grades of the individual examination performances.
<b>Frequency of module</b>	The module is offered every semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one to two semesters depending on the choice of the students.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-FFK 508	Introduction to Professional and Academic Language: Working with Texts and Oral Communication (CEFR C1)	Ute Meyer sz.ausbildung-pruefung@tu-dresden.de
<b>Qualification aim</b>	Students possess the ability to communicate competently in a foreign language of their choice, both in writing and orally, at level C1 of the Common European Framework of Reference for Languages. This includes the comprehension of demanding longer science-, subject- and profession-related texts. Students can express themselves fluently, clearly structured and in detail in writing and orally using extended structures and an extensive general and specialized vocabulary on complex subjects. They are able to express themselves spontaneously and flexibly in the chosen language. They have mastered relevant communication techniques and also possess intercultural competence.	
<b>Content</b>	Contents of the module are in a foreign language of the student's choice: <ul style="list-style-type: none"> <li>- Introduction to the language of science</li> <li>- reading and listening strategies</li> <li>- subject- and science-related text work and technical discussions on the topic of studies and profession</li> <li>- media for (autonomous) language acquisition</li> <li>- subject-related presentations.</li> </ul>	
<b>Teaching and learning methods</b>	4 SWS language course and independent study. The languages German as a foreign language and English are selectable.	
<b>Requirements for participation</b>	General language knowledge and skills at CEFR C1 are required. If necessary, the language level can be proven by a placement test.	
<b>Usability</b>	The module is a compulsory elective module in the area of Foreign Language Communication, of which modules worth a maximum of 10 credit points can be selected from the module group Supplements in the master's degree program Transportation Economics, of which modules worth 30 credit points must be selected. The module cannot be selected in the master's program Transportation Economics if the same language has already been completed in the bachelor's program Verkehrswirtschaft. It creates the prerequisites for the acquisition of the language certificate TU-Certificate Introduction to the Professional and Scientific Language CEFR C1.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of 90 minutes duration and a oral presentation in the extent of 30 hours, both of which must be graded at least "sufficient" (4.0) according to § 14 paragraph 1 of the examination regulations.	

<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the unweighted average of the grades of the individual examination performances.
<b>Frequency of module</b>	The module is offered every semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one to two semesters depending on the choice of the students.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-FFK 509	Introduction to Professional and Academic Language: Written Communication and Application Training plus one Profile Course (CEFR C1)	Ute Meyer sz.ausbildung-pruefung@tu-dresden.de
<b>Qualification aim</b>	The module aims to enable students to become proficient in the target language and culture, especially in academic and professional contexts. Course participants master academic writing techniques and also have intercultural competence. They learn to deal with the application process in all its parts, to write the CV and to develop personal application strategies. Foreign language competence in the above areas corresponds to level C1 of the Common European Framework of Reference for Languages.	
<b>Content</b>	Contents of the module are in a foreign language of the student's choice: <ul style="list-style-type: none"> <li>- techniques of scientific writing</li> <li>- subject- and culture-related communication</li> <li>- Application training including the writing of a curriculum vitae.</li> </ul>	
<b>Teaching and learning methods</b>	4 SWS language course and independent study. The courses are to be selected from the module's catalog of offerings; this catalog, including the respective required examination performances and weights as well as combination restrictions, is announced at the beginning of the semester as is customary for the faculty. The languages German as a foreign language and English can be selected.	
<b>Requirements for participation</b>	Language skills of the chosen language at level C1 of the Common European Framework of Reference for Languages are required. If necessary, the language level can be proven by a placement test.	
<b>Usability</b>	The module is a compulsory elective module in the area of Foreign Language Communication, of which modules worth a maximum of 10 credit points can be selected from the module group Supplements in the master's degree program Transportation Economics, of which modules worth 30 credit points must be selected. The module cannot be selected in the master's program Transportation Economics if the same language has already been completed in the bachelor's program Verkehrswirtschaft.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of a written examination of maximum 90 minutes duration and an oral examination performance as a group or individual examination of 30 minutes duration, both of which must be graded at least "sufficient" (4.0) according to § 14 paragraph 1 Examination Regulations.	
<b>Credit points and</b>	5 credit points can be acquired through this module. The module	

<b>grades</b>	grade results from the unweighted average of the grades of the individual examination performances.
<b>Frequency of module</b>	The module is offered every semester.
<b>Workload</b>	The total workload is 150 hours.
<b>Duration of the module</b>	The module lasts one to two semesters depending on the choice of the students.

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-AQUA	Additional General Qualifications for Transportation Economists	Studiendekan/in Verkehrswirtschaft studiendekan.vwi@tu-dresden.de
<b>Qualification aim</b>	The students possess additional general qualifications in one or more areas of competence, which meaningfully complement and round off the compulsory and elective modules of the master's program in Transportation Economics. In addition, the students are strengthened in their personality.	
<b>Content</b>	The content of the module is the acquisition of general qualifications in one or more areas of competence.	
<b>Teaching and learning methods</b>	Independent study as well as courses of at least 2 SWS of the student's choice from the offer "Additional General Qualifications for Transportation Economists" for the master's program Transportation Economics. The courses, including the required examinations, are announced at the beginning of the semester in accordance with the usual faculty practice.	
<b>Requirements for participation</b>	No special knowledge is required.	
<b>Usability</b>	The module is a compulsory elective module in the area of Additional General Qualification, of which modules amounting to a maximum of 5 credit points can be selected from the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points must be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of at least one graded examination performance according to the requirements of the respective selected offerings.	
<b>Credit points and grades</b>	5 credit points can be acquired through this module. The module grade results from the unweighted average of the grades of the individual examination performances.	
<b>Frequency of module</b>	The module is offered every semester.	
<b>Workload</b>	The total workload is 150 hours.	
<b>Duration of the module</b>	The module lasts one semester.	

<b>Number of module</b>	<b>Name of module</b>	<b>Lecturer</b>
VW-TEc-MA-BP	Vocational Internship	Studiendekan/in Verkehrswirtschaft studiendekan.vwi@tu-dresden.de
<b>Qualification aim</b>	The students are able to apply their knowledge of transport and economics to specific problems in transport economics in practice. Furthermore, the students are familiar with typical professional activities and procedures. The students possess key qualifications in the area of social competence and the ability to work in a team. Furthermore, the students are strengthened in their personality.	
<b>Content</b>	The content of the module is the application of knowledge of transport and economics in professional practice and becoming familiar with specific requirements in the profession.	
<b>Teaching and learning methods</b>	The module includes a professional practice of at least 11 weeks (time blocked).	
<b>Requirements for participation</b>	Competencies to be acquired in the modules Operations Research and Logistics, Methods in Transport Policy, Spatial Economics and the Environment, Theoretical Multivariate Statistics, and Methods in Data Analytics are required.	
<b>Usability</b>	The module is a compulsory elective module in the area of Professional Practice of the module group Supplements in the master's program Transportation Economics, of which modules amounting to 30 credit points are to be selected.	
<b>Requirements for the award of credits</b>	The credit points are awarded when the module examination is passed. The module examination consists of an ungraded internship report.	
<b>Credit points and grades</b>	15 credit points can be acquired through this module. The module is graded "passed" or "failed" according to the grading of the examination performance according to § 12 paragraph 1 sentence 5 Examination Regulations.	
<b>Frequency of module</b>	D The module is offered every semester.	
<b>Workload</b>	The total workload is 450 hours.	
<b>Duration of the module</b>	The module lasts one semester.	