

ECTS Information Package 2005

Technische Universität Dresden

**Faculty of Traffic and Transportation Sciences
"Friedrich List"**

"Transportation Economics"

Welcome in the fascinating world of mobility and transport

The transport system is an important part of the society and economy in every country. Transport provides the basis for a lot of purposes for example: the transport of goods, passengers, information and data, services, energy and capital. Without an excellent transport system the prosperity of a modern economy would be impossible. Everybody takes advantage of a good working transport system that is able to satisfy our mobility requirements.

Therefore it is necessary to build up a network of different infrastructure systems and transport processes. The solution of this task is very complex because the transport system conjoins a lot of spheres in our community e.g. policy, economy and environment. The decisions are affected by different lobbies. Highly qualified and motivated experts are needed to meet these challenges. Experts of transport and management try to get to the bottom of transport problems, analyze complicated transport issues and develop efficient solutions for the transport sector.

Faculty of Traffic and Transportation Sciences “Friedrich List”:

<http://www.vkw.tu-dresden.de/>

<http://www.fsr-verkehr.de/>

With the new structure of the curriculum, the attempt was made to teach the subject as a broad, interconnected, and above all, socio-economic, engineering system. The range of the determining influences and processes of moving people, freight and information is wide spread from socio-political issues to technically specific engineering problems. It is the task of the transport sciences to cope with these influences and processes on a scientific basis, with the goal of explaining and predicting the kind and amount of transportation of people, freight and information. Furthermore it is the aim to develop methods for economic evaluation, in terms of both the national economy as well as for business administration. They include integrated planning for all modes of transportation, the construction and operation of transportation facilities and vehicles, transportation telematics, traffic and transportation safety engineering, the needs of electric railways, etc.

The Faculty of Traffic and Transportation Sciences “Friedrich List” offers two independent study programmes for about 1100 students with close to 30 professors.

1. Traffic and Transportation Engineering and
2. Transportation Economics

Additional study programmes with other faculties that also teach basic transportation scientific contents are:

3. Mechatronics (in co-operation with other faculties)
4. Mechanical Engineering (in co-operation with other faculties)
5. Electrical Engineering
6. Civil Engineering
7. Geography
8. Economics
9. Architecture/Landscape Architecture

There is no other University in Germany besides the Dresden University of Technology that offers such a compact and integrated traffic and transportation related study programme.

Course of studies "Transportation Economics"

The course of studies "Transportation Economics" is a unique offer in Germany. The main components of the curriculum comprise lectures in Business Administration and Economics adopted to the special challenges and needs of the companies, organisations and authorities in the transport sector as well as basic knowledge in traffic engineering.

In the main courses the students can choose different opportunities to deepen their knowledge in the following profiles:

- Transport Economics and International Transport Policy
- Economics, esp. Macroeconomics and Spatial Economics/ Regional Sciences
- Transport Business Administration and Logistics
- Communication Economics & Management
- Tourism Economics & Management
- Traffic Modelling and Econometrics

Following aims should be reached in the studies:

- Students should acquire abilities to grasp problems of transport, to analyse them with scientific methods and to acquire solutions appropriate.
- The studies should prepare the students for the manifold professional employment-possibilities, to enable them to change between tasks and branches in the later profession-life. It should support the readiness and ability for mobility and flexibility.
- Students have the option to draw up their studies with reference to their interested topics and future business activities. The students could choose corresponding subject-combinations to give their education a special direction.

Basic structure of the course of studies "Transportation Economics"

The duration of the studies is 9 semesters including the compulsory practical training and the diploma examination.

Transportation Economics is divided into two sections and encompass

- Basic studies → 4 semesters
- Main studies → 5 semesters (including diploma-semester)

Content of the basic studies:

The basic studies comprise mainly courses in business administration and political economy, methods of traffic and transport sciences as well as natural sciences and fundamentals of traffic and transport engineering.

There are in detail:

Business Administration	18 SWS /	27 Credit Points
(Macro) Economics	12 SWS /	18 Credit Points
Law	10 SWS /	15 Credit Points
Mathematics	8 SWS /	12 Credit Points
Statistics	8 SWS /	12 Credit Points
Computer Science	6 SWS /	9 Credit Points
Basics of Transport Engineering	12 SWS /	18 Credit Points
Languages	4 SWS /	6 Credit Points
Environment and Transport	2 SWS /	3 Credit Points
Interactive Lecture	3 SWS /	4 Credit Points
Σ	83 SWS /	124 Credit Points

In the basic studies the lectures in Business Administration and Economics are offered by the Department of Business Management and Economics. The Faculties of Mathematics and Natural Science, Law and Computer Science are responsible for the adequate lectures Mathematics, Law etc. The finish of the basic studies is the preliminary diploma.

Content of the main studies

The main studies can be divided into two sections. The first section includes specialized knowledge in Transportation Economics as well as related disciplines.

The student enrolls the following compulsory and obligatory subjects:

Compulsory Subjects:		
Business Methods of Transportation Economics		8 SWS / 12 Credit Points
Economic Methods of Transportation Economics		8 SWS / 12 Credit Points
Quantitative Methods of Transportation Economics		8 SWS / 12 Credit Points
Obligatory Subjects:		
Core Courses 1	Institute for Transport & Economics	8 SWS / 12 Credit Points
Core Courses 2	Institute for Transport & Economics	8 SWS / 12 Credit Points
Core Courses 3	Institute for Transport & Economics/ Business Management and Economics	8 SWS / 12 Credit Points
Core Courses 4	Institute for Transport & Economics/ Transport Sciences/	8 SWS / 12 Credit Points
Supplementary Courses		24 SWS / 36 Credit Points
Σ		80 SWS / 120* Credit Points

*12 Credit Points have to be Credit Points from seminars.

The second section of the main studies includes the production and disputation of the diploma project.

Our unique course offers focus in particular young people, who have got the baccalaureate and are interested in a business and economic oriented education in the transport sector. The regular duration of the curriculum is 9 semesters and finish with the diploma degree of "Diplom-Verkehrswirtschaftler" (equivalent to Master of Science [M.Sc.] in Transportation Economics).

The alumni take up employment in all spheres of the transport sector, first of all in the transport companies directly, but also in great industrial enterprises with corporate owned logistic units, in other companies providing services, for example in the tourism industry, in the telecommunication sector, in the Internet Economy as well in different transportation authorities, in transport planning offices or administration bodies of the municipalities or federal states. There is also the possibility to get a job in research facilities.

Forecast Bachelor/Master

Dresden is also working on keeping the further development of lectures up to date. The reformation of studies is a continuous process. In Dresden the demand for interdisciplinarity and the imparting of basic traffic and transportation knowledge has been successfully accomplished to a great extent. However, this is partly done in basic lectures with more than 300 students and with the lack of proper equipment which every university has to deal with.

The discussions concerning the Bologna Process are also taking place in Dresden. At the moment the plan is to establish several master programmes. The faculty remains critical of the demand to educate students as qualified employees with the academic degree of bachelor.

Nevertheless, the discussion about the reformation also offers prospects for a further modularization, flexibility and with it an improvement of traffic related interdisciplinary degree study programmes in Dresden.

Types of Courses:

Courses in Transportation Economics are lectures (Vorlesungen), pro-seminars (Proseminar), main-seminars (Hauptseminar), exercise classes (Übungen), tutorials (Tutorien), colloquia (Kolloquien) and interactive lectures (interaktive Lehrveranstaltungen).

1. Lectures (V)

Lectures are intended to give the students an overview of a specific field of their studies. They are conducted by professors and usually do not involve student activities such as presentations or essays. Nevertheless reading the recommended literature is necessary in order to follow the lecture. Lectures are open to all students.

2. Seminars (S)

Seminars largely depend on the students' work. In co-operation with a lecturer students should work out specific issues of a given topic. Talking part in a seminar involves taking part in discussion, giving presentations and writing essays. The students are advised to sign up for a seminar in advance.

2.1. Pro-Seminars

Their tasks are the deepening, intensification and complement of the acquired knowledge especially for students of the first for semesters. The number of participants is limited.

2.2 Main-Seminars

A main-seminar is for advanced students during the main-studies. The students should acquire deepened knowledge of problems of single cases. This arises the opportunity to work independent and scientific. Basic knowledge is expected. The number of participants is limited.

3. Exercise Classes (Ü)

Exercise Classes are usually designed to use the knowledge gained from lectures or seminars.

Students have to work out exercises or cases. The number of participants can be limited.

4. Tutorials (T)

Tutorials introduce in to scientific work and give an overview of relevant literature, methods and techniques in the field of study. Tutorials are designed for fresher and are often carried out by advanced students. Students work in little groups. The number of participants can be limited.

5. Colloquia (K)

Colloquia usually take place in the end of the main studies. Here the students will discuss the final thesis with other examination candidates, the supervisor and other members of the faculty. The number of participants can be limited.

6. Interactive Lecture

An interactive lecture should familiarize the students with scientific work. New media like courseware or offers from Distance-Learning could be used.

Please pay attention to the university calendar, postings at the POTTHOF-Building and the internet (www.fsr-verkehr.de).

	1. Semester		2. Semester		3. Semester		4. Semester	
Propedeutic Contents	Mathematics I Accounting Language I	4 SWS 2 SWS 2 SWS	Mathematics II Language II Computer Science I	4 SWS 2 SWS 2 SWS	Computer Science II	4 SWS	Environment and Transport	2 SWS
Business Administration	Introduction in Business Administration (EBWL) Cost Accounting Introduction to Transport Economics	2 SWS 2 SWS 2 SWS	Annual Accounting Investment Appraisal Production I / Logistics I Basics in Technology and Innovation Management/ Marketing I	2 SWS 2 SWS 2 SWS 2 SWS	Production II / Logistics II Aspects of Human Resource Management	(2 SWS)	Financing / Basics in entrepreneurship Aspects of Organization/Marketing II	(2 SWS)
Economics	Foundation in Economics (EVWL)	2 SWS			Macroeconomics I Microeconomics II	2 SWS 2 SWS	Macroeconomics II Microeconomics II Mathematical Analysis Instruments	2 SWS 2 SWS 2 SWS
Transportation Technology					Theory of Transportation Systems I Basics Transportation Systems	4 SWS 2 SWS	Theory of Transportation Systems II Transportation and Infrastructure Planning	2 SWS 4 SWS
Law	Civil Law I Public Law	2 SWS 2 SWS	Civil Law II (especially commercial law and society law)	2 SWS	Industrial Law	2 SWS	Transportation Law	2 SWS
Statistics			Statistics I	2/2 SWS	Statistics II	2/2 SWS		
Supplementary Courses							Interactive Course	3 SWS
Semester periods per week (SWS)		20		22		20 (22)		19 (21)
Credit Points (CP/LP)		30		33		30 (33)		28 (31)

The following table shows all compulsory and obligatory subjects on the main studies:

Study Schedule as a recommendation

Subject	Scope of Supply									
	5.		6.		7.		8.		9.	
	SWS	LP	SWS	LP	SWS	LP	SWS	LP	SWS	LP
Compulsory Subjects										
Business Methods of Transport Economics	8	12			-	-	-	-	-	-
Economic Methods of Transport Economics	4	6	4	6	-	-	-	-	-	-
Quantitative Methods of Transport Economics	4	6	4	6	-	-	-	-	-	-
Obligatory Subjects										
Core Courses 1 Institute for Transport and Economics ¹⁾			8*	12*	-	-	-	-	-	-
Core Courses 2 Institute for Transport and Economics ¹⁾	4	6	4	6	-	-	-	-	-	-
Core Courses 3 Transport Sciences/ Business Management and Economics	-	-	-	-	4	6	4	6	-	-
Core Courses 4 Transport Sciences/ Business Management and Economics	-	-	-	-	4	6	4	6	-	-
Supplementary Courses	-	-	-	-	12	18	12	18	-	-
Diploma Thesis Transportation Economics										30
Total (80 SWS / 150 CP)	20	30	20	30	20	30	20	30		30

- 1) - Transport Economics and International Transport Policy
 - Economics, esp. Macroeconomics and Spatial Economics/ Regional Sciences
 - Transport Business Administration and Logistics
 - Communication Economics & Management
 - Tourism Economics & Management
 - Traffic Modelling and Econometrics

* Only possible for the choice of "Transport Business Administration and Logistics"
 (Core Course in one semester)

Glossary:

Be	research project
HS	main-seminar
K	colloquium
KL	test
LP	Credit Points (CP)
LVA	type of course
mPr	oral examination
Pr	project-seminar
PS	pro-seminar
S	seminar
Se	seminar paper
SS	summer term
SWS	semester periods per week (2 SWS = 1 lecture over 90 min)
Ü	exercise
V	lecture
WS	winter term

Diploma Study Programme of Transportation Economics

Compulsory Subjects:

Quantitative Methods of Transportation Economics:

Subject: Theoretical Transport Planning and Econometrics

[Professorship of Traffic Modelling and Econometrics – Prof. Helbing]

This course deals with transport planning, system analysis and modelling techniques (incl. fundamentals of classical and fuzzy logic), models of economic growth, the solution of systems of linear differential equations, the input-output model for the description and prediction of product flows (incl. regional aspects). Dynamic models of supply networks and methods for network analysis are treated as well.

Subject: Operations Research and Logistics

[Professorship of Transport Business Administration and Logistics – Prof. Haase]

The lecture offers an introduction to the basics of operations research. In addition, students are enabled to model optimisation problems. Thereby, solution approaches are presented, especially decomposition methods, to solve large and complex logistic problems by means of an algebraic language, so-called GAMS (General Algebraic Modelling System).

Business Methods of Transportation Economics:

Subject: Service Marketing

[Professorship of Tourism Economics & Management – Prof. Freyer]

The service industry is a rapidly growing economic sector. The course provides advanced knowledge of special marketing approaches to services: the service chain, service quality and development of marketing concepts for the service industry.

Subject: Management Systems and Techniques in Transport Companies

[Professorship of Transport Business Administration and Logistics – Prof. Haase]

The lecture deals with economic questions, the management of a transport company faces. It describes the interaction of strategic, tactical and operational decision levels to reach given targets. Apart from the strategic planning system, instruments of management subsystems like human resources and revenue management in transport companies are presented. Furthermore, project management is treated as a cross-functional operation. The aim of the lecture is to enable students to use the knowledge in decision situations on leadership level.

Economic Methods of Transportation Economics:

Subject: Methods of Transportation Economics I

[Professorship for Economics, esp. Macroeconomics and Spatial Economics/
Regional Science – Prof. Hirte]

Deepening of the Micro-Economics relating to transportation-economic questions and problems:

- basics of budget- and production theories
- generic balance and efficient allocation
- problematic nature of environment: external effects
- infrastructure: public goods
- technological risks: decisions under risk and uncertainty

Subject: Methods of Transportation Economics II

[Professorship of Transport Economics and International Transport Policy – Prof. Wieland]

This lecture is closely related to the lecture “Methods of Transportation Economics I” and has the aim of introducing tools and theories for analysing causes and consequences of transport. Furthermore, this lecture should help students to evaluate goals and instruments of transport policy. The main focus is here on competition and regulatory problems in connection with the transport market. Among the topics covered are different market structures like natural monopoly, oligopoly or monopolistic competition. The lecture also contains a section on competition policy with a focus on barriers to entry and market concentration. The lecture closes with the description of different regulatory regimes using the analytical tools from principal-agent-theory.

Obligatory Subjects:

**Professorship of *Communications Economic*,
Faculty of Traffic and Transportation Sciences “Friedrich List”**

[Kommunikationswirtschaft und Kommunikationsmanagement]

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The chair is specialized in teaching and research in communications economics and management. It is a special field of business administration and management focussing on the design, production, offering, marketing and application of electronic communications networks and services and the markets in information and communications (IC) industry. The following topics are covered:

- Position and function of the IC sector in the overall economy
- Internet Economy
- Telecommunications markets and competition
- Management and marketing strategies for companies in IC sector
- Methods of cost-efficiency-analysis for IC networks, systems and services
- business cases in telecommunications
- Quality, customer satisfaction and retention in telecommunications markets
- Success factors, applications, business models and efficiency of e-Business and m-Business
- Markets and applications of mobile communication
- Access-alternatives for new carrier in the telecommunications market

The following courses can be chosen:

Sem.	Elementary Courses	Hours/Week	Cr	Type of Course	Examination
SS	Investment appraisal	2	3	L	WrE 60

Sem.	Core Courses	Hours/Week	Cr	Type of Course	Examination
WS	Information and communications economics in the information society	2/1	4	L/C	WrE 120
SS	Management of information and communications companies	2/1	4	L/C	WrE 120
	Applications and case studies in communications industry	2	4	L	WrE 120
		8	12		

Sem.	Supplementary Courses	Hours/Week	Cr	Type of Course	Examination
WS	Marketing in IC-companies	2	3	L	WrE 90
	Seminar for advanced students I	2	4	S	Se
	Seminar for advanced students II	2	4	S	Se
SS	Electronic communications markets and competition	2	3	L	WrE 90
WS + SS	Seminar for graduates and Ph.D. students	2		W	

Description of the courses:

VKW Investment Appraisal

Goal: Students will get an overview about the most important investment appraisal methods for evaluation of investment projects in the business decision making process.

Based on the fundamental terms of investment and financing of industrial goods in companies the basics of financial mathematics are discussed. Adapted from methods of static and dynamic investment analysis and assessment decision alternatives are discussed and calculated. Thereby for instance the influence of taxes will be considered by determination of the net present value. Furthermore ascertainment methods of optimal asset life time and optimal time for reinvestment are figured out as well as classical and simultaneous decision making methods for investment programs and investment and financial budgets. Aspects of uncertainty and risks in investment decision processes are considered by adoption of correction methods and sensitivity analysis.

Previous Knowledge: Basic knowledge of business administration and mathematics
Examination: Written exam
Teacher: Prof. Dr. Ulrike Stopka

VKW Economics of electronic communications networks and services in the Information Society

Goal: Students will acquire scientific based knowledge and practical experiences about business processes in production, marketing and application of electronic communications networks, services and systems. They will be enabled to evaluate the specific circumstances and demands of the IC-industry and the Internet Economy from the supplier's and the consumer's site in order to make the right business decisions.

The course emphasises the information and communications industry as a strategic sector within the national and international economy. The special features and characteristics of network industries under the focus of the network economics are worked out. The information and communications economy is based on different IC networks. The lecture gives an overview about the most important elements and structures of IC networks under the special focus of Next Generation Networks. Assessment and evaluation methods concerning economic efficiency and profitability of electronic IC services, networks and systems are discussed. The most important methods and practices in the frame of cost-benefit evaluation, investment theory and shareholder value analysis are discussed and realized practically in exercises. The calculation of business cases completes the lecture.

Previous Knowledge: Basic knowledge in Business Administration in the field of communication networks and services
Examination: Written exam
Teacher: Prof. Dr. Ulrike Stopka

VKW Management of Information- and Communications Companies

Goal: Students will get a well-founded knowledge about the specifics of companies in IC industry. They will be enabled to develop different business strategies to valuate them for business management reasons and to educe recommendations for actions in consideration of the network economy's characteristics.

The course focuses on strategic corporate management of IC companies. Based on the

knowledge of the network economy specific changes of business models for provider, customers and intermediaries will be outlined. This is followed by a discussion of strategic consequences for IC business especially pointing out new forms of co-operation and networking. This includes the analysis of basic operational mechanism in network economics and the explanation of business development under the strategic management perspective. The business assessment of implemented strategies in digital networks is based on the shareholder value approach. This monetary valuation standard provides an explanation indicator for establishing alliances, co-operations and syndication strategies.

Previous Knowledge: Basic knowledge in the field of communications networks, systems and services, basic knowledge in the field of innovation management and network economy

Examination: Written exam

Teacher: Dr. Thomas Urban

VKW Applications and Case Studies in Communications Business

Goal: Students will deepen their theoretical and practical knowledge of design, production, marketing and application of IC networks, services and systems.

Practical case studies and applications of internet business, telecommunications, multimedia and mobile communication markets and industry are presented and discussed. The main topics are focused on current market trends like voice over IP, penetration of broadband access and services, UMTS, Public Wireless LAN etc. This is supported by lectures of experts from IC companies. The students have to carry out case studies on their own initiative.

Previous Knowledge: Basic knowledge in the field of communications networks and services, basic knowledge in the field of innovation management and business administration

Examination: Written exam

Teachers: Prof. Dr. Ulrike Stopka, Dr. Thomas Urban

VKW Electronic Communications Market and Competition

Goal: In the lecture the students deal with the ongoing processes of liberalization and regulation in national and international telecommunications markets under the focus of competition policy and law. The students get basic knowledge of the European regulatory framework for electronic communications networks and services and the tasks of the national regulatory authorities.

Starting from the basic structure of the suppliers and competitors in national and international telecommunications markets the reasons for the structural changes in this sector are discussed. The relevant competition model is figured out.

Based on the European regulatory framework the most important topics of market regulation and competition are considered. This includes the topics of

- market access,
- the definition of relevant markets,
- assessment of significant market power (SMP) and designation undertakings with SMP in the relevant market,
- the procedure for public consultation, consolidation and publication of proposed decisions of the national regulatory authorities,
- the regulation of network access and interconnection,
- the regulation of charges and pricing,

- the regulation of universal services.

The problems are discussed in closed connections between the economic and legal aspects, e. g. by regarding different cost models underlying the price regulation procedures.

The consideration of regulatory experiences and results in neighbour markets like transport or energy as well as the special experiences in the US and GB markets complete the lecture.

Previous Knowledge: Basic knowledge in competition law, telecommunications economics and industrial economics

Examination: Written exam

Teacher: Prof. Dr. Ulrike Stopka

VKW Marketing in IC companies

Goal: Students will get recessed knowledge about specifications in marketing of IC services and products. They will be enabled to use product, pricing, communication and distribution marketing tools to develop marketing strategies for IC companies.

The marketing processes in IC industry differ from those in the classical industries because of the dynamic processes concerning consumer acceptance and appearances of demand and use gaps. The lecture focuses therefore on electronic media for new product strategies (e. g. versioning and bundling), on innovative pricing strategies (e. g. e-pricing, revenue models in internet), on changing communication strategies (e. g. individualisation of customer relationship and internet branding) as well as on various forms and channels of distribution (e. g. t-commerce, m-commerce). It will be shown how marketing strategies for IC companies can be implemented and assessed.

Previous Knowledge: Basic knowledge in the field of marketing, internet economy, controlling

Examination: Written

Teacher: Dr. Thomas Urban

VKW Seminar for Advanced Students I + II

Goal: Students carry out research tasks or small project cases including the presentation of the research results.

The seminar for advanced students I + II covers current problems of IC markets. Enrolled students are expected to write a seminar paper on a specific topic of the IC industry or Internet Economy which has to be presented. Students are given the possibility to train writing scientific papers and to discuss their results. The seminar will be completed by different experts from IC companies, political or economical institutions.

Previous Knowledge: Basic knowledge of IC economics

Examination: Seminar paper and presentation

Teachers: Prof. Dr. Ulrike Stopka; Dr. Thomas Urban

**Professorship of *Tourism Economics & Management*,
Faculty of Traffic and Transportation Sciences “Friedrich List”**

[Tourismuswirtschaft und Tourismusmanagement]

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The chair is specialised in teaching and research in tourism economics and management.

Research topics covered are:

- **tourism politics:** the development of tourism undertaken by public and private tourism organisations and institutions
- **special management issues for tourism businesses** such as tour-operators, travel agents, hotel and catering facilities, public tourism organisations, leisure facilities and health and spa tourism infrastructure
- **market research in tourism:** methodological foundations and implementation of market research in the areas of travel behaviour, guest satisfaction and image analysis
- **tourism and ecology:** ecological responsible and sustainable tourism management
- **tourism and traffic:** economic foundations of traffic and transport companies, market analysis and traffic management concepts in tourism
- **spa and health tourism:** development of spa tourism in certified spa resorts, economic analysis of health tourism

The following courses can be chosen:

Sem.	Core Courses	Hours/Week	Cr	Type of Course	Examination
WS	Introduction: Tourism Economics & Management	2	3	L	WrE 90 and AssW
	Introduction: Tourism Economics & Management	2	3	C	
SS	Tourism Marketing	2	3	L	WrE 90
	Tourism Policy	2	3	L	WrE 90
		8	12		

Sem.	Supplementary Courses	Hours/Week	Cr	Type of Course	Examination
SS	Lecture Series Tourism Economics & Management	2	3	L	WrE 90
SS	Law of Tourism (part I)	1	1	L	WrE 45
+	Law of Tourism (part II)	1	2	L	WrE 45
WS	Advanced Seminar Tourism Economics & Management (2-semester)	4	6	AdvS	Se
	Project Seminar Tourism Economics & Management (1-semester)	2	3	PS	Se
	Lesson Tourism Economics & Management ¹⁾ (for Erasmus-Students)	2		T	
	Graduand workshop²⁾	(2)		K	
	Doctorand workshop¹⁾	(2)		K	

¹⁾ not complete semester

²⁾ not complete semester, obligatory for graduands

Description of the courses:

VBW Introduction: Tourism Economics & Management

This lecture gives an overview of the tourism system and introduces tourism economics and management. The special characteristics of tourism are being demonstrated and analysed. Models for a holistic understanding of the tourism system are introduced and their use in the management of tourism is analysed. Furthermore, the distinct characteristics of tourism economics and management are demonstrated and thus tourism is being differentiated from other business and economic subjects. Tutorial using case studies and classes on the same subjects help to deepen the acquired knowledge and to demonstrate the principles of tourism.

Previous Knowledge: Basic knowledge of business studies

Examination: Written examination

Teacher: Prof. Dr. Walter Freyer

VBW Tourism Marketing

Modern marketing management methods are being employed in the area of tourism. A characteristic and distinct tourism marketing theory is being developed and analysed. Modern methods, concepts and principles of marketing and their application to the tourism industry are here taught. Methods and tools for the development of modern marketing concepts for tourism businesses as well as destinations are being demonstrated. The role of tourism marketing as a management orientation or philosophy is a central aspect in this course.

Previous Knowledge: Introduction: Tourism Economics & Management

Examination: Written examination

Teacher: Prof. Dr. Walter Freyer

VBW Tourism Policy

Economic impacts of tourism on national, regional and local economies and planning theories and regulations in tourism are the main aspects covered in this course. The economic importance of tourism and the distinct models and theories of tourism economics are being developed. The political objectives, planning methods, regulations and models are being analysed and interpreted.

Previous Knowledge: Introduction: Tourism Economics & Management
Examination: Written examination
Teacher: Prof. Dr. Walter Freyer

Goal: The subject of „Tourism Economics & Management“ enables emphasis to be placed on various business and economic studies. It is recommendable to combine this with further disciplines of transportation science and tangential subjects of other courses of economic studies (e.g. personnel management, cost accounting, marketing and business informatics). The international aspect of tourism requires command of foreign languages. In addition to this, there is a close connection to other fields of social sciences (e.g. leisure, sports, culture, ecology and transportation). During the lectures and seminars offered in the field of tourism management, special attention is given to the tourism industry and various tourism-specific enterprises as well as the possibility to transfer business and economics basic knowledge and methodical bases to this sector of industry.

VBW Advanced Seminar Tourism Economics & Management

Goal: The seminar aims to teach students how to develop and write an academic paper in a specific tourism related field and how to present it in an orderly manner.

The aim of this seminar is to apply the acquired theoretical knowledge to real life case studies in the tourism industry during two semesters. Topical issues relevant to tourism are selected, analysed and demonstrated by the students. The results are presented and discussed.

Previous Knowledge: Introduction: Tourism Economics & Management, Tourism Marketing, Tourism Policy, Tourism Management
Examination: Written assignment and presentation
Teacher: Prof. Dr. Walter Freyer

VBW Project Seminar Tourism Economics & Management

Goal: The seminar aims to teach students how to develop and write an academic paper in a specific tourism related field and how to present it in an orderly manner.

The aim of this seminar is to apply the acquired theoretical knowledge to real life case studies in the tourism industry during one semester. Topical issues relevant to tourism are selected, analysed and demonstrated by the students. The results are presented and discussed.

Previous Knowledge: Introduction: Tourism Economics & Management, Tourism Marketing, Tourism Policy, Tourism Management
Examination: Written assignment and presentation
Teacher: Prof. Dr. Walter Freyer

VBW**Lecture Series Tourism Economics & Management**

Goal: The lecture series will give a general introduction to the tourism phenomenon and underline the interdisciplinary linking of the topics.

The series will provide a general look into the tourism phenomenon and emphasise the interdisciplinary connection of the topic. Tourism-related topics will be addressed from the perspectives of various representatives from academia and practice. This course is normally offered in the summer semester and deals with current topics.

Examination: Written examination
Teacher: Prof. Dr. Walter Freyer

VBW**Law of Tourism - Part I: The Air Transportation**

Goal: The lecture will provide basic knowledge of practical application in the field of travel contract law.

This lecture presents the legal aspects of national and international transportation of passengers and luggage by air. The rights and obligations of all persons involved in an air carriage will be demonstrated and the legal system will be explained. Moreover, the various possibilities to pass the liability limitation will be demonstrated.

Examination: Written examination
Teacher: Prof. Dr. Roland Schmid

VBW**Law of Tourism - Part II: The Package Tour Contract**

Goal: The lecture will provide basic knowledge of practical application in the field of travel contract law.

This lecture presents the legal aspects of package tours under German law. Rights and obligations of all persons involved in the travel contract (tourist, tour operator, travel agency, carrier, hotel etc.) will be demonstrated. Afterwards, the potential warranty claims in the case of breach of contract or defective performance by the tour operator will be explained.

Examination: Written examination
Teacher: Prof. Dr. Roland Schmid

**Professorship of Transport Business Administration and Logistics,
Faculty of Traffic and Transportation Sciences „Friedrich List“****[Verkehrsbetriebslehre und Logistik]**

Prof. Dr. Knut Haase

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The future of enterprises in the transport sector of industry crucially depends on the ability to continuously align themselves to changing environments. Transport companies have to position themselves strategically, have to extend their administrative capabilities and to customize their operations. The resulting demand for innovative scientific methods in order to design management systems as well as for highly qualified graduates with analytic competence is satisfied by the research and teaching procedures conducted by our professorship.

The research activities of the professorship aim at creating and enhancing a data-, model- and method-capability. With this in mind, and in addition to theoretic modelling, efficient data-processing applications are specifically implemented in the field of modelling technology, simulation software, geographic information systems and empirical research. Based on this, practice-related recommendations created. The overall aim of teaching is the integration of research activities, the developed strategies, methods and models, in order to provide students with up-to-date and suitable tools for solving complex problems. The education is therefore predominated by a balance of issues that are, on the one hand, related to research, and on the other hand, close to practical experience. Additionally, special presentations and cooperative seminars with leading representatives of industry complete the student's training.

The university education aims at establishing basic understanding of complex problems in transport companies and in the field of logistics. Referring to the aims of student's training, the communication of the theoretical basis in lectures is accompanied by the enhancement of active participation of students, supported by seminars (individual work and presentation) and colloquia (independent proceeding of projects). Quantitative approaches in connection with data processing for dealing with practice-relevant problems form the centre of this professorship.

Topics in teaching and research are:

- management of transport companies
- transport and logistics management
- models and methods for production of public transport services
- flexible service systems for public transport services
- design of transport networks
- location planning and vehicle routing
- mobility analysis and modelling
- algebraic modelling languages
- geographic information systems

The following lectures can be chosen:

Sem.	Core Courses	SWS	LP	LVA	Exami- nation
SS	Production of Public Transport Services	2/2/0	6	V/Ü	KI 120
	Logistics	2/2/0	6	V/Ü	KI 120
		8	12		

Sem.	Supplementary Courses	SWS	LP	LVA	Examination
WS	Supply Chain Management and e-Logistics	2/0/0	3	V	KI 90
	International Transport and Logistics Management	2/0/0	3	V	KI 90
	Management of Public Transport Companies	2/0/0	3	V	KI 90
SS	Management of Air Transport Operations	2/0/0	3	V	KI 90
WS + SS	Seminar on Current Topics in Transport and Logistics Management	0/0/2	4	HS	Se
	Colloquium „Transport and Logistics“	0/0/2	3	K	Be, mPr
	Diploma Colloquium	0/0/2		K	

Sem.	Other Courses	SWS	LP	LVA	Examination
WS	Introduction to Transport Economics <i>(Basic studies)</i>	2/0/0	3	V	KI 90
	Management Systems and Techniques in Transport Companies <i>(Main studies - Business Methods of Transportation Economics)</i>	2/2/0	6	V/Ü	KI 120
	Operations Research and Logistics <i>(Main studies - Quantitative Methods of Transportation Economics)</i>	2/2/0	6	V/Ü	KI 120

Description of the lectures:

VBW Production of Public Transport Services
S 2/2/0 6 cr

The production process of a public transport company includes various tasks. Examples are network design, timetabling, vehicle scheduling, crew scheduling, crew rostering and dispatching. In addition to passenger transport, delivery of internal (controlling) and external (schedules, real time passenger information) information are part of the service portfolio. All of these tasks are discussed and solution methods are presented.

Prerequisites: Operations Research and Logistics
Examination: Written examination
Lecturer: Prof. Dr. Knut Haase and assistants

VBW **Logistics**
S **2/2/0** **6 cr**

Logistics can be seen as a cross-functional operation including procurement, production and distribution. The main subject is optimising material flows in terms of costs and time. Apart from suppliers and customers, the actors of the logistics chain and information management are taken into account. For this, useful concepts, models and efficient approaches to solve these problems are presented. Warehouse location problem, production program planning, transport and route planning are discussed in depth.

Prerequisites: Operations Research and Logistics
Examination: Written examination
Lecturer: Prof. Dr. Knut Haase and assistants

VBW **Supply Chain Management and e-Logistics**
W **2/0/0** **3 cr**

The cooperation of companies along the supply chain is becoming the decisive factor in competition. Causally related, supply chain management was developed, dealing with the implementation of frictionless flows of goods and information. Initially, goals and strategies of supply chain management are presented. Afterwards, causes and measures to avoid conflicts in cooperations between independent companies are discussed. Additionally, the lecture focuses on the analysis of logistic structures predominant in B2C (business-to-consumer) and B2B (business-to-business) configurations. In this respect, various problems, arising in connection with buying goods over the Internet, are discussed, and different solutions for delivery are examined which are evaluated by means of ideal logistic structures.

Prerequisites: Basic knowledge in business administration and logistics
Examination: Written examination
Lecturer: Prof. Dr. Knut Haase and assistants

VBW **International Transport and Logistics Management**
W **2/0/0** **3 cr**

Tools to analyse international transport and logistic networks are conveyed. Basic knowledge necessary to handle international transport and logistic operations is taught. The lecture starts with basic economic theories considering the topics of globalisation and the manifestation of multinational companies. The lecture introduces concepts for the development of international logistic networks and discusses the problems arising from dispersed supply chains. Central topics are the intercultural challenge and the necessity of risk management (financial/operational hedging). The second part focuses on the most important trading regulations, trade and customs procedures. International financial transactions are also explained. The lecture concludes with an analysis of the framework for international inter or intra mode competition.

Prerequisites: Basic knowledge in business administration and logistics
Examination: Written examination
Lecturer: Prof. Dr. Knut Haase and assistants

VBW Management of Public Transport Companies
W 2/0/0 3 cr

The lecture deals with important aspects of managing a public transport company. It focuses on local public transport. The presentation starts with introducing the basic factors, which determine demand in the public transport market as well as the basic legal conditions. A large part of the lecture is concerned with the marketing of regional transport companies, paying special attention to planning and the use of service marketing instruments as well as marketing controlling. The final part looks at the structures and tasks of transport associations in terms of cooperating in public transport. This also includes the calculation of line performance and success as well as revenue distribution between companies in transport associations.

Prerequisites: Basic knowledge in business administration
Examination: Written examination
Lecturer: Prof. Dr. Knut Haase and assistants

VBW Management of Air Transport Companies
S 2/0/0 3 cr

The lecture conveys and explains instruments used by management of transport companies. Strategic management and operations planning are especially described from a CEO point of view. In addition to well known management concepts, specific problems and subsequent solutions, encountered in the areas of innovation, finance, organisation and marketing of transport companies, are discussed. A case study is used to emphasize the practical orientation of these instruments and to demonstrate the problems, the management of a transport company faces.

Prerequisites: Introduction to Transport Economics
Examination: Written examination
Lecturer: Hon. Prof. Heinz Ruhnau

VBW Seminar on Current Topics in Transport and Logistics Management
W/S 0/0/2 4 cr

The seminar has two main objectives. On the one hand, basic knowledge in writing scientific papers is conveyed. On the other hand, topical subjects in transport resulting from research activities of the professorship or cooperation agreements with various transport companies are discussed.

Prerequisites: Basic knowledge in business administration, transportation economics and logistics
Examination: Seminar paper with presentation
Lecturer: Prof. Dr. Knut Haase and assistants

VBW Colloquium "Transport and Logistics"
W/S 0/0/2 3 cr

The colloquium pursues two main objectives. On the one hand, students discuss core research activities of the chair. Fruitful debates serve the purpose of preparing theses. On the other hand, team work on projects is focused on.

Prerequisites: Basic knowledge in business administration, transportation economics and logistics
Examination: Project paper and oral examination
Lecturer: Prof. Dr. Knut Haase and assistants

VBW **Diploma Colloquium**
W/S **0/0/2** **0 cr**

In the diploma colloquium graduands present intermediate results of their theses. Afterwards, the procedure of their theses, problems and possible solutions are discussed.

Prerequisites: Study of the subject Transport Business Administration and Logistics
Examination: (Diploma thesis)
Lecturer: Prof. Dr. Knut Haase and assistants

VBW **Introduction to Transport Economics**
W **2/0/0** **3 cr**

The lecture offers an introduction to the economic and managerial principles of transport and logistics. The focus is on the similarities as well as differences between the various transport modes, means of transport, infrastructures and the basic principles of their deployment by transport companies.

The review by market segments is augmented by an overall analysis of the entire transport market. Students get an insight into the specifics of the transport sector and the production of transport services.

Prerequisites: Basic knowledge in business administration
Examination: Written examination
Lecturer: Prof. Dr. Knut Haase and assistants

VBW **Management Systems and Techniques in Transport Companies**
W **2/2/0** **6 cr**

The lecture deals with economic questions, the management of a transport company faces. It describes the interaction of strategic, tactical and operational decision levels to reach given targets. Apart from the strategic planning system, instruments of management subsystems like human resources and revenue management in transport companies are presented. Furthermore, project management is treated as a cross-functional operation. The aim of the lecture is to enable students to use the knowledge in decision situations on leadership level.

Prerequisites: Basic knowledge in business administration and logistics
Examination: Written examination
Lecturer: Prof. Dr. Knut Haase and assistants

VBW **Operations Research and Logistics**
W **2/2/0** **6 cr**

The lecture offers an introduction to the basics of operations research. In addition, students are enabled to model optimisation problems. Thereby, solution approaches are presented, especially decomposition methods, to solve large and complex logistic problems by means of an algebraic language, so-called GAMS (General Algebraic Modelling System).

Prerequisites: Basic knowledge in business administration
 Examination: Written examination
 Lecturer: Prof. Dr. Knut Haase and assistants

**Professorship of *Traffic Modelling and Econometrics*,
 Faculty of Traffic and Transportation Sciences „Friedrich List“**

[Verkehrsökonomie und -modellierung],

Prof. Dr. Dirk Helbing

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Research and education focuses on the quantitative and/or computer-based analysis, modelling, simulation, and optimization of active multi-component systems, e.g. on statistical and econometric analyses of economic or traffic data, on multi-agent simulations of socio-economic systems, on behavioral models, decision and game theory, on self-organization phenomena in space and time, on optimization of vehicle and pedestrian traffic or production processes and supply networks, on stochastic methods and Monte-Carlo simulations, and on the theoretical link between micro- and macro-dynamics. The goal of the courses is the mastery of the treated methods and the ability to transfer and apply them to new problems.

Lectures	V/Ü/S	Credits
Theoretical Transport Planning and Econometrics	2/2/-	6
Multivariate Transport Analysis	2/2/-	6
Traffic Dynamics and Simulation	2/2/-	6
Stochastic Models and Methods	2/2/-	6
Linear and Nonlinear Dynamic Models	2/2/-	6
Fundamentals of Theoretical Transport Planning	2/1/-	4,5
Seminar "Traffic Modelling and Econometrics"	-/2	4

Description of the lectures:

VQV Theoretical Transport Planning and Econometrics
S 2/2/- 6 cr.

This course deals with transport planning, system analysis and modelling techniques (incl. fundamentals of classical and fuzzy logic), models of economic growth, the solution of systems of linear differential equations, the input-output model for the description and prediction of product flows (incl. regional aspects). Dynamic models of supply networks and methods for network analysis are treated as well.

Prerequisites: Mathematics, Statistics
Examination: Written Exam (120 minutes)
Lecturer: Prof. Dr. Dirk Helbing

VQV Multivariate Transport Analysis
S 2/2/- 6 cr.

This course introduces the most important multivariate statistical methods, e.g. cluster analysis, regression analysis, analysis of variance, discriminant analysis, and factor analysis. The exercises teach the use of corresponding statistics software.

Prerequisites: Mathematics, Statistics (and Computer Science)
Examination: Written Exam (120 minutes) or Oral Exam or Evaluated Exercises
Lecturer: Prof. Dr. Dirk Helbing

VQV Traffic Dynamics and Simulation
W 2/2/- 6 cr.

This course introduces models and methods for the analysis, calculation, and prognosis of traffic flows and their spatiotemporal evolution. Covered topics include traffic data analysis, macroscopic and microscopic traffic modeling and traffic-related optimization and intelligent transportation management.

Prerequisites: Mathematics, Statistics (and Computer Science)
Examination: Written Exam (120 minutes) or Evaluated Exercises or Oral Exam
Lecturer: Prof. Dr. Dirk Helbing

VQV Stochastic Models and Methods
S 2/2/- 6 cr.

This course introduces important mathematical methods for the description of random processes, for example, Markov chains, queuing models, the master equation, the Fokker-Planck equation and/or the Langevin equation. The applications concern mostly socio-economic systems and transport problems. The exercises introduce basics of object-oriented programming with C++ and the use of the production planning software eM-Plant.

Prerequisites: Mathematics, Statistics (and Computer Science)
Examination: Written Exam (120 minutes) or Evaluated Exercises or Oral Exam
Lecturer: Prof. Dr. Dirk Helbing

VQV Linear and Nonlinear Dynamic Models
W 2/2/- 6 cr.

This course deals with the mathematical and statistical analysis, description, and prognosis of time series data. Relevant topics are, e.g. the estimation of trends and seasonal changes, the Fourier and wavelet analysis, as well as ARIMA, RCAR, NLAR, and GARCH-processes. The lecture also treats basics of chaotic time series and fractals. The exercises teach the application of these methods to economic and traffic data with the help of relevant software.

Prerequisites: Mathematics, Statistics (and Computer Science)
Examination: Written Exam (120 minutes) or Oral Exam or Evaluated Exercises
Lecturer: Prof. Dr. Dirk Helbing

VQV Fundamentals of Theoretical Transport Planning
W 2/1/- 4,5 cr.

This course introduces the general concepts and methods of theoretical transport planning. Starting with an analysis of the relevant data base, the course deals mainly with the framework of traffic generation, traffic distribution, mode choice and traffic assignment.

Prerequisites: Mathematics, Statistics
Examination: Written Exam (120 minutes) or Oral Exam or Evaluated Exercises
Lecturer: Prof. Dr. Dirk Helbing

VQV Seminar "Traffic Modelling and Econometrics"
W/S -/-/2 4 cr.

Participants of this seminar present and explain a literature overview of recent publications in the field of Traffic Modelling and Simulation, or they develop and present results of their own research. The seminar is thought to be a preparation for the diploma thesis. The possible topics reach from the statistical analysis of empirical data over traffic modelling and simulation up to game and decision theory, or optimization of production processes and supply networks.

Prerequisites: Mathematics, Statistics (and Computer Science)
Examination: Seminar Paper and Talk
Lecturer: Prof. Dr. Dirk Helbing

**Professorship of *Transport Economics and International Transport Policy*,
Faculty of Traffic and Transportation Sciences „Friedrich List“**

[Verkehrswirtschaft und Verkehrspolitik],

Prof. Dr. Bernhard Wieland

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The main area of teaching and research of this professorship is the economic analysis of regulation of the transport sector. Methods of Microeconomics, Industrial Economics and the New Institutional Economics are employed to analyze the question in how far market forces can work in the transportation sector and where state intervention is warranted.

Module	V/Ü/S	Credits
Transport Policy I: Institutional and Theoretical Foundations of Transport Policy	2/0/0	3
Transport Policy II: Costs and Prices in Transport	2/2/0	6
Transport Policy III: The Economics of Transport Infrastructure	2/1 ¹⁾ /0	3
Transport Policy IV: International Transport Policy, Part 1	2/0/0	3
Transport Policy IV: International Transport Policy, Part 2	2/0/0	3
Transport Policy V: Cost-Benefit-Analysis for Transport Investments	2/0/0	3
Seminar in Transport Policy	0/0/2	4
Total:	12/3/2	22

¹⁾ Facultative Exercise.

Description of the lectures:

VVW 04-01 Institutional and Theoretical Foundations of Transport Policy
W 2/0/0 3 cr

This lecture lays the groundwork for all following lectures in transport policy. The lecture starts with a few basic facts illustrating the economic importance of the transport sector and with a short description of the industrial structure of the various subareas of transport. The aim of the second part of the lecture is to equip the student with the analytical apparatus necessary to analyze questions of transport policy from an economist's point of view. The focus here is on analytical tools taken from the economic theory of regulation and from industrial economics.

The next part of the lecture applies these tools to discuss the various arguments that have been given to support regulation of the transport sector.

The lecture closes with a short overview over the history of German transport policy and the most important problems which transport policy faces today.

Prerequisites: Basic knowledge of microeconomics

Examination: Written

Lecturer: Prof. Dr. rer. pol. habil. Bernhard Wieland and assistants

VVW 04-02 Costs and Prices in Transport
W 2/2/0 6 cr

In every sector of the economy costs and prices determine supply and demand. They also bear a close relationship to the regulations that govern a particular mode of transportation. Among the topics covered in this lecture are economies of scale and scope, subadditivity of a cost function, the empirical estimation of a cost function, the problem of allocating common costs, the problem of costing the road infrastructure, Ramsey prices, non-linear tariffs, peak-load pricing, congestion fees, access to essential facilities, access to the railway infrastructure.

This lecture is closely related to the lecture entitled „Institutional and Theoretical Foundations of Transport Policy“. Both lectures are devoted to providing the student with the necessary theoretical prerequisites to analyze questions of transport policy.

Prerequisites: Basic knowledge of microeconomics

Examination: Written

Lecturer: Prof. Dr. rer. pol. habil. Bernhard Wieland and assistants

VVW 04-03 The Economics of Transport Infrastructure
S 2/1/0 3 cr

The main topics of this lecture are the importance of a nation's transport infrastructure for the economy at large, the possibilities to privatize infrastructure provision, and methods of infrastructure planning (basic methods of economic planning, investment criteria, evaluation of investment projects). The lecture closes with an analysis of German infrastructure planning in the transportation sector.

Prerequisites: Basic knowledge of microeconomics

Examination: Written or oral

Lecturer: Prof. Dr. rer. pol. habil. Bernhard Wieland and assistants

VVW 04-04 International Transport Policy, Part 1 and 2
S 2/0/0 3 cr

These lectures have two main topics: First, transportation policy in other countries (notably the United States and the United Kingdom). Second, transportation policy in the European Union.

The focus on the United States and the United Kingdom is justified by the fact that these two countries may be regarded as a kind of test-laboratory with respect to deregulation and privatization. The transport policy of the EU cannot be analyzed without knowledge of the developments in these two anglo-saxon countries.

Prerequisites: Transport Policy I
Examination: Written
Lecturer: Prof. Dr. rer. pol. habil. Bernhard Wieland and assistants

VVW 04-05 Cost-Benefit-Analysis for Transport Investments
W 2/0/0 3 cr

This lecture gives an introduction to the theory and practice of cost-benefit-analysis with special reference to investments in the transportation sector.

Prerequisites: Basic knowledge of microeconomics
Examination: Written
Lecturer: Prof. Dr. rer. pol. habil. Bernhard Wieland and assistants

VWI 04-06 Seminar in Transport Policy
W/S 0/0/2 4 cr

This seminar is devoted to the discussion of practical and theoretical questions of transport policy. Students must write a paper and present it to the participants.

Prerequisites: Transport Policy I-II
Examination: Written paper and seminar presentation
Lecturer: Prof. Dr. rer. pol. habil. Bernhard Wieland and assistants

Professorship for *Economics, esp. Macroeconomics and Spatial Economics/Regional Science*, Faculty of Traffic and Transportation Sciences „Friedrich List“

[Raumwirtschaft]

Prof. Dr. Georg Hirte

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This chair is working in the field of spatial economics. Methods based on microeconomic theory are applied to study the determinants of regional divergence or convergence and structural change. Research focuses on the spatial impact of European economic integration and of transport infrastructure investment. The chair offers the core courses „Spatial Economics“ and supplementary courses.

Following lectures can be chosen:

Core Courses:	V/Ü/S	Credits
Spatial Economics I	2/2/0	6
Spatial Economics II	2/2/0	6
Supplementary Courses:	V/Ü/S	Credits
Seminar in Regional Science	0/0/2	4
Empirical Methods of Regional Research	2/2/0	6
New Economic Geography	2/0/0	3
Regional Economic Policy	2/0/0	3
Urban Econometrics	2/2/0	6

Description of the lectures:

WWW Spatial Economics I
W 2/2/0 6 cr.

This is an introductory course to the classical theories of location and to urban economics. It starts by analysing the problem of optimum firm location and with a detailed discussion of location factors. Next, pricing and locational interdependence of firms in different market environments are studied. Then Lösch's approach to explaining an economic landscape is presented. Finally, neoclassical theories of landuse in a monocentric world (Thünen and Alonso) and modern theories of urban economics are developed. In the exercise course students present papers on some topics of spatial economics.

Prerequisites: Basic knowledge of microeconomics
 Examination: Written (presentation in the exercise course is required)
 Lecturer: Prof. Dr. Georg Hirte and Dr. Jörg Jeran (Ü)

WWW Spatial Economics II
S 2/2/0 6 cr.

This course deals with the theory of interregional trade. It introduces three generations of trade models: classical Ricardian trade theory, neoclassical trade theory and "new" trade theory focusing on economies of scale and imperfect competition. Empirical trade models, including the gravity approach, are also introduced. It is shown how different theories fit the data. Finally, the approach of the New Economic Geography is explained. In the exercise course students present papers on some topics of spatial economics.

Prerequisites: Basic studies in microeconomics
 Examination: Written (presentation in the exercise course is required)
 Lecturer: Prof. Dr. Georg Hirte and Dr. Jörg Jeran (Ü)

WVW **Seminar in Regional Science**
W/S **0/0/2** **4 cr.**

The graduate seminar is meant to give the students the possibility of looking at some special field of regional science in detail. The students have to write a paper and have to present it during a lesson. The seminar deals with topical theoretical issues as well as current problems in the field of regional science, such as the regional development in unified Germany, the regional impact of investment in infrastructure and innovation and regional development.

Prerequisites: Spatial Economics I and II
Examination: Paper, presentation and discussion
Lecturer: Prof. Dr. Georg Hirte and assistants

WVW **Methods in Regional Science**
S **2/2/0** **6 cr.**

This course is about data retrieval and quantitative methods in regional science. Methods include descriptive techniques such as shift and share analysis as well as multivariate analysis, including regression, cluster analysis, discrete choice models and input-output analysis. The second part is a computer course. Students are introduced to software packages and have to study small real world problems, using multiregional data sets.

Prerequisites: Basic statistics
Examination: Written or oral
Lecturer: Prof. Dr. Georg Hirte and assistants

VVW **New Economic Geography**
W **2/0/0** **3 cr.**

This is a course composed of lectures and short presentations given by the students on the rapidly developing economics' approach to geography. It is based on a general equilibrium model with a production sector characterized by increasing returns to scale and interregional transport costs. We discuss in detail how the transport sector induces or prevents agglomeration or dispersion of economic activities and thus determines the structure of urbanization.

Prerequisites: microeconomics
Examination: Written or oral
Lecturer: Prof. Dr. Georg Hirte

WVW **Regional Economic Policy**
S **2/0/0** **3 cr.**

This is a course composed of lectures and short presentations given by the students. Topics are: competition among regions, revenue and expenditure of regional and local authorities, regional labour markets, the economic effects of the German and European regional policy as well as economic effects of European integration on the regions.

Prerequisites: microeconomics
Examination: Written or oral
Lecturer: Prof. Dr. Georg Hirte

WVW

Urban Econometrics
S 2/2/0 6cr.

In a combination of lectures and tutorials the theoretical fundamentals of urban economics will be taught in this course. The focus will be on the following subjects: the monocentric closed city, the polycentric closed city, housing, urban transportation, public facility location, local public economics, public infrastructure and amenities, agglomeration effects and city formation, externalities, urban systems and city growth. This course will be taught in English.

Prerequisites: microeconomics
Examination: Written or oral
Lecturer: Prof. Dr. Georg Hirte

Diploma Study Programme of Traffic and Transportation Engineering:

Fields of studies:

- Transportation Planning and Traffic Engineering
- Transportation System Engineering and Logistics (Major fields of studies: Railway and Public Transportation, Aviation, Transportation Logistics)
- Transportation Telematics
- Planning and Operation of Electrical Transportation Systems

Branches of Traffic and Transportation Engineering for Transportation Economists:

Core Course:

Transportation and Infrastructure Planning/Verkehrsplanung, Verkehrsraumgestaltung
[Prof. Dr. Ahrens]

> q.v. Homepage

Core Course:

Road Traffic Engineering/Straßenverkehrstechnik
[Prof. Dr. Maier]

The main principles of all transportation facilities are:

- *safety*
- *capacity*
- *compatibility*

the rating scale in this case is the economic efficiency.

The evaluation of safety and the capacity of transportation facilities deals with the quality of service that can be provided for trips and transportation tasks and especially about the level of safety accompanying it.

The main topic of this chair is to teach design procedures that lead to an adequate choice of the infrastructure and its equipment components.

The research activities deal with the effects that parameters of traffic engineering have on the level of quality and safety, as well as eliminating the competing aims of traffic flow and safety in particular.

The subjects our lectures deal with are:

- Principles of traffic flow (on roads)
- Level of service and traffic safety concerning the different road users on their specific road elements; links and junctions
- Traffic analysis and design procedures
- Traffic safety in terms of design and operation of roads ("Quality Network")

Core Course:

Transportation Ecology / Verkehrsökologie für Verkehrswirtschaftler

[Prof. Dr. Becker]

Transportation Ecology is defined as the area of science which covers all relations between transportation and the environment. The varied connections and feedbacks at this area can only be investigated systems comprehensive, integrated and under inclusion of the three fields

- causes of transportation,
- transportation itself (real transportation processes, vehicles, technology, behaviour) and
- effects of transportation.

Here, direct effects are to be included in all considerations as well as indirect effects; long-term effects are to be considered as well as short-term effects. Within this context, two general areas of interest and a number of regions of specialisation are established.

General areas of interest:

- *Transport and the environment (direct effects):*
development of all tools, estimation models and technical knowledge in the areas fuel consumption, pollutants and CO₂-emissions, noise, safety, land consumption etc.
- *Basics of transport (indirect effects):*
consideration of transport economics, external and internal costs, generated/induced traffic, sustainability, socio-economic systems etc.

Regions of specialisation:

- Emissions of road traffic (measurement, modelling, future developments)
- Emissions of rail, air and ship traffic
- Energy and CO₂ in transport worldwide (all countries, transport totals, each mode)
- Noise, safety levels, land consumption, water and soil contamination by transport
- Sustainable mobility: How is it defined, how can it be approached?
- Evaluating positive and negative external and internal effects of transport ("true costs of transport"), definitions, estimation methods, results, internalization strategies

Core Course:

Technology and Logistics of Aviation/Luftverkehr

[Prof. Dr. Fricke]

Key Aspects of Research:

Air Transport Infrastructure Planning

Assessment of airport location, planning and design of arrival and departure routes as well as ground infrastructure planning have become very important in the densely populated air space. Key aspects of investigation are safety, operational feasibility, costs and environmental issues.

Air Transport System Technologies

Based on ICAO CNS/ATM (Communication - Navigation - Surveillance, Air Traffic Management) concepts new technology assists air traffic controllers in their decision making. A system that is able to display the current and future traffic situation improves the controller's situational awareness. Current research projects are focused on the transmission and implementation of the aircraft's TCAS alerts and advisories into the air traffic controller's system. Also, the impacts of new arrival and departures procedures to capacity, operational convenience and safety are under investigation.

Ground Handling Simulation: Optimizing Ground Handling and Passenger Flow Processes

The analysis of current ground handling processes in terminals shows a remarkable optimization potential. The aim of our research is to develop the most efficient utilisation of the ground handling process in conjunction with modern passenger guidance concepts. In this context emergency management for the safe guidance of the individual passenger at any time is crucial. Safety, security and punctuality are the key factors in this field. Based on new technology for check-in and security check a new approach ("Trusted Passenger") will be subject to validation.

Capacity Analysis: Correlating Capacity and Safety

The capacity of today's air transport system components can be determined quite precisely through comprehensive data acquisition and available COTS Simulation Tools. Hence, no correlation between technologically or operationally increased capacity to safety impacts have been formulated so far. Current research addresses this gap: A Safety Correlator for Terminal Areas is subject of intensive research.

Logistics in Air Transport

This field deals with the optimisation of ground handling processes at the airport. Research is focused on integrated information management. Current projects investigate the Collaborative Decision Making process (CDM) of the airport, air traffic control and the airlines.

Environmental Load of Engines

These projects dealt with noxious emission of piston engines and the use of MOGAS in general aviation. An emission reduction method (with little performance loss) has been developed based on performance on an engine test stand. Moreover an introduction of digital engine control (FADEC) has been tested.

Core Course:

Transportation Logistics/Verkehrslogistik und Planung von logistischen Betrieben

[Dr. Sprecher]

> q.v. Homepage

Core Course:

Railway Traffic, City and Suburban Transportation/Systemtechnik des Bahn- und ÖPN-Verkehrs

[Prof. Dr. König]

> q.v. Homepage

Core Course:

Traffic Communication Systems / Nachrichtenverkehrssysteme

[Prof. Dr. Bärwald]

> q.v. Homepage

Core Course:

Transportation Telematic Networks/Verkehrstelematiknetze

[Prof. Dr. Bärwald]

> q.v. Homepage

Core Course:

Traffic Information Systems/Informationstechnik für Verkehrssysteme

[Prof. Dr. Jentschel]

Research Interests

Modelling and design of circuits and systems Analog and digital signal processing Design and application of adaptive systems Mixed-signal and multi-level simulation Electronic design automation

Fields of Application

Image processing in traffic engineering Mobile communication (wireless LAN) Innovative architectures for radio receivers Systems on Chip (SoC)

Core Course:

Transportation Telematics/Verkehrstelematik

[Prof. Dr. Krimmling]

> q.v. Homepage

Core Course:

Traffic and Transportation Psychology / Psychologie für Verkehrswirtschaftler

[Prof. Dr. Schlag]

Traffic and transportation psychology is a young expanding field in psychology with a nonetheless long scientific tradition. Some of the first empirical studies of psychology dealt with traffic-related questions, especially with the aptitude of human beings for driving motor vehicles (e.g. Münsterberg, 1913; Moede, 1926). In the German-speaking area the main emphasis of traffic-psychological practice has since then been put on diagnostics, counselling, rehabilitation and extra driving education of conspicuous drivers. Since the introduction of the new road traffic law in 1999 even more fields of occupational activity in this domain of traffic and transportation psychology have developed. But traffic psychologists in practice and research also deal with questions of mobility in general and of behaviour in road traffic in particular, often in co-operation with engineers, economists or medics. Six areas of traffic and transportation psychology can be distinguished as follows (see also Groeger & Rothengatter, 1998; Schlag, 1997):

1. Traffic-psychological diagnostics: aptitude-diagnostics for driving, especially after conspicuousness in driving behaviour;
2. Counselling, rehabilitation and extra driving education for drivers who have become conspicuous;
3. Accident research and improvement of traffic safety, particularly in relation to groups of road users (age groups, modes of transport), but also in relation to the design of traffic routes and motor vehicles; perception, cognition and attentiveness when driving, risk-preparedness and motives for driving, interactions and the social psychology of the driver;
4. Education and information: influencing of behaviour with legal, pedagogical, vehicle- and road-specific measures; curricular and extra-curricular traffic-education; driving education, driving-instructor-education, information on traffic issues, campaign-design and marketing;
5. Research and counselling regarding questions of mobility and traffic engineering: mobility psychology, choice of means of transport, psychological aspects in designing routes and traffic environment, quality of supplies and quality-management;
6. Vehicle-design: questions of ergonomics, but also of dealing with offers by the vehicle (e.g. risk compensation), analysis of essential driving tasks and of preconditions which drivers will need for coping with the tasks, designing vehicles, acceptance of technical and organisational innovations; also: rail- and flight-psychology as further development areas.

Empirical research in traffic and transportation psychology looks above all into the optimisation of current practice and into innovative areas from which relevant traffic-psychological occupations may develop. Traffic and transportation psychology not only uses theoretical and methodological principles of psychology; it is especially because of its interdisciplinary integration an innovative research area partly with its own methodology and original theoretical approaches. Still, knowledge and procedures from other scientific areas play an important role. The common subject of research always is the mobility-behaviour and experience of the human being.

Recapitulating overlook of the selectable core courses in the main studies of Transportation and Communication Economics

Department of Business Administration and Economics		Faculty of Traffic and Transportation Sciences		Outside of Faculty of Traffic and Transportation Sciences and Department of Business Administration and Economics
Institute for Transport and Economics	Institute of Traffic and Transportation Engineering			
<p>Business Management</p> <ul style="list-style-type: none"> ▪ Corporate Management and Marketing ▪ Environmental Management ▪ Marketing ▪ Finance and Financial Services ▪ Managerial Accounting and Control ▪ Auditing and Managerial Taxation ▪ Human Resource Management ▪ Organization ▪ Logistics ▪ Entrepreneurship and Innovation Management ▪ Energy Management <p>Economics</p> <ul style="list-style-type: none"> ▪ Public Finance ▪ Allocation Theory ▪ International Economics ▪ Money, Credit and Currency ▪ Managerial Economics ▪ Economic Policy and Economic Research ▪ Empirical Finance and Financial Research <p>Business Informatics</p> <ul style="list-style-type: none"> ▪ Information Systems in Industry and Trade ▪ Systems Engineering ▪ Informationsmanagement ▪ Information Systems in the Service Sector <p>Business Education</p> <ul style="list-style-type: none"> ▪ Business Education for other course of studies <p>Hybrid Subject</p> <ul style="list-style-type: none"> ▪ Health Economics ▪ International Corporate Management ▪ Behavioural Economics and Finance <p>-----</p> <p>Core Courses with 8 SWS / 12 CP; Supplementary Courses different</p>	<p>Transport Business Administration and Logistics</p> <p>Transport Economics and International Transport Policy</p> <p>Traffic Modelling and Econometrics</p> <p>Economics, esp. Macroeconomics and Spatial Economics/Regional Science</p> <p>Communications Economics & Management</p> <p>Tourism Economics & Management</p> <p>-----</p> <p>Core Courses with 8 SWS / 12 CP; Supplementary Courses different</p>	<p>Transportation Planning and Traffic Engineering</p> <ul style="list-style-type: none"> ▪ Transportation and Infrastructure Planning ▪ Theoretical Transportation Planning ▪ Road Traffic Engineering ▪ Transportation Ecology <p>Transportation System Engineering and Logistics</p> <ul style="list-style-type: none"> ▪ Transportation Logistics ▪ Technology and Logistics of Aviation ▪ Railway Traffic, City and Suburban Transportation <p>Transportation Telematics</p> <ul style="list-style-type: none"> ▪ Traffic Communication Systems ▪ Transportation Telematics ▪ Traffic Information Systems ▪ Transportation Telematic Networks <p>Traffic and Transportation Psychology</p> <p>-----</p> <p>Core Courses with 8 or rather 9 SWS / 12 CP; Supplementary Courses different</p>	<p>English for Economists</p> <p>French for Economists</p> <p>Spanish for Economists</p> <p>Russian for Economists</p> <p>(see also center of special languages / Fachsprachenzentrum)</p> <p>-----</p> <p>Core Courses with 8 SWS / 12 CP; Supplementary Courses different</p>	