Master Air Transport and Logistics

„Friedrich List“ Faculty of Transport and Traffic Sciences
TU Dresden

Introduction

Dresden, September 2023

Why studying Air Transport and Logistics?

- aviation industry is known for its continuous expansion and persistent development, its cutting-edge technologies inspires other industries
- aviation research, development and operation is focused on current and future challenges to enable a responsible, efficient, safe and environmentally compatible use of aviation service

worldwide need for highly qualified aviation specialists

- unique study program which links the operational and planning aspects of air transport and the subjects within logistics and transport system theory
- close cooperation between the faculty and various aviation industry associates

Master Air Transport and Logistics
Semester Structure

CP	1st semester	2nd semester	3rd semester	4th semester
5	**VW-ATL-01 *(Prof. Schönberger)*** Operations Research and Logistics	**VW-ATL-04 (*Dr. Preis)*** Decision Making in Enterprise Logistics	**VW-ATL-06 (*Prof. Fricke)*** Flight Planning and Aircraft Operations	Master's thesis
10	**VW-ATL-02 *(Dr. Preis)*** Material Flow Analysis and Optimization	**VW-ATL-07 (*Prof. Fricke)*** Air Traffic and Airport Operations	**VW-ATL-08 (*Prof. Fricke)*** CNS and tactical ATM	
15	**VW-ATL-03 *(Dr. Treiber)*** Methods in Transport Economics and Statistics			
20	**VW-ATL-05 *(Prof. Fricke)*** Flight Performance and Aerodynamics	Advanced elective module	Advanced elective module	
25		Advanced elective module	*Free elective module*	
30	*Free elective module*	*Free elective module*	*Free elective module*	

General Structure – Module requirements

Mandatory modules

VW-ATL-01	Operations Research and Logistics
VW-ATL-02	Material Flow Analysis and Optimization
VW-ATL-03	Methods in Transportation Econometrics and Statistics
VW-ATL-04	Decision Making in Enterprise Logistics
VW-ATL-05	Flight Performance and Aerodynamics
VW-ATL-06	Flight Planning and Aircraft Operations
VW-ATL-07	Air Traffic and Airport Operations
VW-ATL-08	CNS and tactical ATM

Advanced elective modules

- Each of them equals 5 credit points (CP)
- You need at minimum of 3 to get the required 15 CP

VW-ATL-20	Safety and Airline Management
VW-ATL-21	Terminal Operations
VW-ATL-22	Aircraft Engines
VW-ATL-23	Helicopter Technology
VW-ATL-24	Aircraft Design
VW-ATL-30	Methods in Data Analytics
VW-ATL-31	Theoretical Multivariate Statistics
VW-ATL-32	Material Handling and Storage Systems

Elective modules

- You may choose modules equaling at least 20 CP

VW-ATL-51	Applied Multivariate Statistics
VW-ATL-52	Data-Driven Multivariate Statistics
VW-ATL-53	Management of Public Transport Systems and Services
VW-ATL-54	Applied Computer Sciences
VW-ATL-55	Advanced Theory of Air Transportation Systems and Simulation*
VW-ATL-56	Advanced Theory of Transportation Systems*
VW-ATL-57	Actual Aspects in Optimization of Processes in Transportation and Logistics
VW-ATL-61	Transportation Telematics Networks
VW-ATL-62	Theory of Communication Traffic and Information Transfer Security
VW-ATL-63	Satellite-based and Position-based Communication
VW-ATL-64	Sensor Technology in Transport Systems
VW-ATL-71	Transport and Infrastructure Planning
VW-ATL-72	Basics of traffic modeling
VW-ATL-73	Visual Perception and Lighting Engineering
VW-ATL-74	Traffic and Transportation Psychology
VW-ATL-81	Quality and RAMS Management

- The mandatory part (red) does not allow for options
- You may choose modules of the elective part (yellow and blue) euqaling at least 35 CP
- Fourth semester focuses on the Master thesis. Themes and topics may either be suggested by the student of you put a request to your adviser well in advance

Welcome at TU Dresden

Freshman orientation 2023 (ESE)

- Welcome Week to the TU Dresden and especially to the „Friedrich List“ faculty of Tranport and Traffic Sciences starting on Monday 02.10.2023 to Sunday 08.10.2023
- Plenty orientation events during this week , including official welcome ceremony, get togehter with students and campus tour– timetable follows soon
- Watch for details on: https://www.fsr-verkehr.de/en/freshman-orientation/

Study course contents

First Semester

Module	Lectures of the module	Exam	CP
VW-ATL-01	Operations Research and Logistics: • 90 min lecture + 90 min exercise per week	120 minutes written exam	5
VW-ATL-02	Material Flow Analysis and Optimization: • 90 min lecture + 90 min exercise per week	90 minutes written exam	5
VW-ATL-03	Methods in Transport Economics and Statistics • 90 min lecture + 90 min exercise per week	120 minutes written exam	5
VW-ATL-05	Aircraft Performance: • 90 min lecture per week	• 240 minutes written exam • Laboratory record	10
	Flight Characteristics and Aerodynamics: • 90 min lecture per week • 90 min lecture or excursive – weekly change		
	Fundamentals of Aircraft Engines • 90 min lecture per week • 1 laboratory setup		
Free elective module	See selection on slide 4	Depending on the module	5

Study course contents
Second Semester

Module	Lectures of the module	Exam	CP
VW-ATL-04	Decision Making in Enterprise Logistics: • 90 min lecture + 90 min exercise per week	90 minutes written exam	5
VW-ATL-07	Air Traffic Control: • 90 min lecture per week + 90 min exercise every fortnight	240 minutes written exam	10
	Airport Operations: • 90 min lecture per week + 90 min exercise every fortnight		
	Aviation Law and Policy: • 90 min lecture per week		
Advanced elective module	See selection on slide 4, 9 and 10	Depending on the module	5
Advanced elective module	See selection on slide 4, 9 and 10	Depending on the module	5
Free elective module	See selection on slide 4	Depending on the module	5

Study course contents

Third Semester

Module	Lectures of the module	Exam	CP
VW-ATL-06	Cockpit Technologies: • 90 min lecture per week + 90 min exercise or tutorial every fortnight	180 minutes written exam	5
	Flight Planning: • 90 min lecture every fortnight		
	Meteorology in the Aeronautics • 90 min lecture every fortnight		
VW-ATL-08	Communication & Surveillance: • 90 min lecture per week	240 minutes written exam	10
	Navigation: • 90 min lecture per week + 90 min exercise every fortnight		
	Procedure Design & Air Traffic Flow Management: • 90 min lecture per week + 90 min exercise every fortnight		
Advanced elective module	See selection on slide 4	Depending on the module	5
Free elective module	See selection on slide 4	Depending on the module	5
Free elective module	See selection on slide 4	Depending on the module	5

Advanced elective modules
Details to support selection (1)

Module	Lectures of the module	Exam	CP	Additional Hints
VW-ATL-20	Safety: lecture or exercise 90 min per week Airline Management: lecture 90 min per week	180 minutes written exam	5	Offered in the summer semester (2nd semester)
VW-ATL-21	Terminal Processes: lecture or exercise 90 min per week Security: lecture 90 min per week	120 minutes written exam	5	Offered in the summer semester (2nd semester)
VW-ATL-22	Aircraft Engines: lecture or exercise 90 min per week	90 minutes written exam	5	Offered in the summer semester (2nd semester) Only in German
VW-ATL-23	Helicopter Technologies: lecture 90 min per week	45 minutes oral exam	5	Duration: 2 semester Starts in 2nd semester

Advanced elective modules
Details to support selection (2)

Module	Lectures of the module	Exam	CP	Additional Hints
VW-ATL-24	Aircraft Design: lecture 90 min per week	180 minutes written exam	5	Offered in the winter semester (3rd semester) Only in German
	Aircraft Maintenance: lecture 90 min per week			
VW-ATL-30	Methods in Data Analytics: 90 min lecture + 90 min exercise per week	90 minutes written exam	5	Offered in the winter semester (3rd semester)
VW-ATL-31	Theoretical Multivariate Statistics: 90 min lecture + 90 min exercise per week	120 minutes written exam	5	Offered in the winter 3rd semester)
VW-ATL-32	Material Handling and Storage Systems: 90 min lecture + 90 min exercise per week	90 minutes written exam	5	Offered in the winter semester (3rd semester)

Study Programme
Special Offers of the Chair

The Chair of Air Transport Technology and Logistics - *https://tu-dresden.de/bu/verkehr/ila/ifl*

- Chair Holder: Prof. Dr.-Ing. habil. Hartmut Fricke
- Secretary: Damaris Hähne
- 16 research associates
- Early involvement in research projects of the chair in the context of student jobs and master theses in the following research areas:
  - Airport Operations (*ABM4APOC, BPRO, OpAL*)
  - Traffic Management *(Economic Airspace Evaluation)*
  - Safety *(S-AMAN, OBSERVATOR)*
  - Trajectory Management *(CDO-Speedbrakes, REMAP, UBIQUITOUS)*
  - Urban Air Mobility *(RescueFly)*
- Integration of the simulation labs within the framework of regular courses
  - Airbus A320 Research Simulator
  - Apron Simulator
- Involvement of alumni and industry partners as guests in lectures
- Joint excursions to regional and supra-regional companies in the aviation industry (e.g. Fraport AG, DFS GmbH, Lufthansa Technik, DHL, etc.)

General literature for preparation

- ICAO Doc 4444 (Procedures for Air Navigation Services, PANS-ATM; https://skyrise.aero/wp-content/uploads/2017/03/ICAO-Doc-4444-EN.pdf)
- ICAO Doc 8168 (PANS-OPS; Volume 1 – Flight Procedures https://ffac.ch/wp-content/uploads/2020/11/ICAO-Doc-8168-Volume-I-Flight-Procedures.pdf & Volume 2 - Construction of Visual and Instrument Flight Procedures http://www.icscc.org.cn/upload/file/20190102/Doc.8168-EN%20Aircraft%20Operations%20Volume%20II%20-%20Construction%20of%20Visual%20and%20Instrument%20Flight%20Procedures.pdf)
- Ashford N., Stanton H.P. M. and Moore C.A.: Airport Operations, McGraw-Hill
- Anderson, J. D. Jr.: *Introduction to Flight*. 8thEdition, McGraw-Hill Education, New York, 2016 (https://katalog.slub-dresden.de/id/0-1615506837)
- Kermode, A. C.: *Mechanics of Flight.* 11thEdition, Pearson Education Limited, Harlow, 2006(https://katalog.slub-dresden.de/id/0-538973242)
- Ojha, S. K.: *Flight Performance of Aircraft.*AIAA Education Series, Washington D.C., 1995, DOI 10.2514/4.861826
- Airbus S.A.S, Flight Operations Support & Line Assistance: *Getting to Grips with Aircraft Performance.* Toulouse, 2002, online at: https://www.skybrary.aero/bookshelf/books/2263.pdf
- Airbus S.A.S, Flight Operations Support & Line Assistance: *Getting to Grips with Weight and Balance.* Toulouse, undated, online at: https://www.smartcockpit.com/aircraft-ressources/Getting_To_Grips_With_Weight_and_Balance.html
- ICAO Annexes: https://www.bazl.admin.ch/bazl/en/home/themen/rechtliche-grundlagen/anhaenge-icao.html
- EASA Certification Specifications: https://www.easa.europa.eu/en/document-library/certification-specifications
- Ivanov, D.; Tsipoulanidis, A.; Schönberger, J.: Global Supply Chain and Operations Management - A Decision-Oriented Introduction to the Creation of Value, newest edition
- Sydsaeter, K.; Hammond, P.: Essential Mathematics for Economic Analysis, Financial Times Prentice Hall, Harlow
- Bamberg, G., Baur, F., Krapp, M.: Statistik, Oldenbourg Verlag, München
- Introduction to Logistics Systems Planning and Control; Gianpaolo Ghiani, Gilbert Laporte, Roberto Musmanno · 2004
- Operations Research: Applications and Algorithms; Wayne L. Winston · 2022
- Logistics Systems Analysis; Carlos F. Daganzo · 2013
- Comprehensive Logistics; Timm Gudehus, Herbert Kotzab · 2012

Faculty of Transport and Traffic Sciences „Friedrich List“ at TU Dresden

TUD‘s Faculties organize themselves under the roof of 5 schools:

TECHNISCHE UNIVERSITÄT DRESDEN

School of Science

School of Engineering Science

School of Medicine

School of Humanities and Social Sciences

School of Civil and Environmental Engineering

Foto: TUD / Andrea Surma

Faculty of Transport and Traffic Sciences „Friedrich List“ at TU Dresden

The School of Civil and Environmental Engineering strengths the interdisciplinary cooperation and coordination in teaching, research and administration of it’s 5 Faculties

School of Civil and Environmental Engineering

Faculty of Architecture

Faculty of Civil Engineering Science

Faculty of Environmental Science

Faculty of Business and Economics

Faculty of Transport and Traffic Science

Foto: TUD / Andrea Surma

Faculty of Transport and Traffic Sciences „Friedrich List“ at TU Dresden

7
Institutes

22
Chairs

1
Faculty

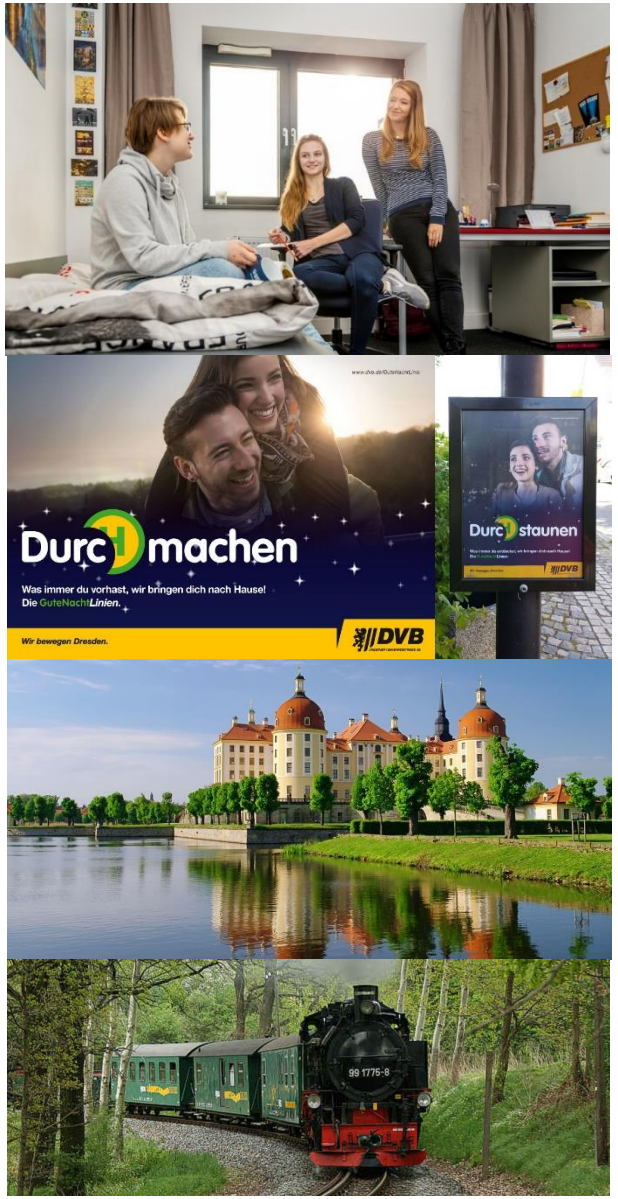
Degree = very good
Job prospects

Comprehensive
Overall view of
Mobility and Transport

Foto: TUD / Andrea Surma

Dresden – great to study and to live

- *Party* – Highest density of student clubs in Germany
- *Housing* – Low rents for shared flats and halls of residence of TU Dresden compared to the rest of Germany
- *Mobility* – One of the best local public transport in Germany incl. night lines of the Dresdner Verkehrsbetriebe, included in the semester ticket as well as the “Saxony Ticket” ; 4 minutes by tram to the main railway station (frequent service), long-distance train connections -> Hamburg, Berlin, Rostock, Erfurt, Frankfurt, Prague
- *Transport attractions* – narrow-gauge railways (Lößnitz and Weißeritztalbahn), steamers, funicular railway, suspension railway
- *Nature* – Saxon Switzerland National Park, Elbe cycle path, Elbe meadows
- *Art and culture* – numerous theatres, museums, jazz and techno clubs (e.g. for 5 euros to the Semper Opera or the Schauspielhaus)
- *Also* – an extremely committed student council at the “Friedrich List” Faculty of transport and traffic sciences



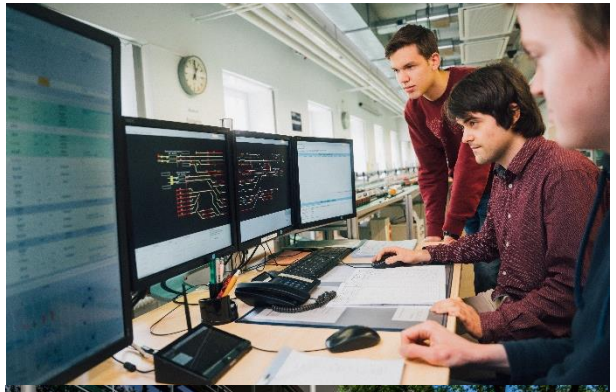
Study and Campus

STUDY

- Modern, practical teaching
- Many options for specialization
- Relatively free choice of topics for academic papers
- Manageable course sizes
- Spacious teaching rooms
- Student body: committed student council

CAMPUS

- Everything at one location: (almost) all courses in the Gerhard Potthoff Building
- Lecture hall centre with Audimax within walking distance (2 minutes)
- State and University Library 3 minutes by bus (frequent service)
- Mensa nearby (about 3 minutes)



Important points of contact

https://tu-dresden.de/bu/verkehr/studium/studienangebot/ma_lul?set_language=en

https://tu-dresden.de/bu/verkehr/ila/ifl?set_language=en

Student Council Transport and Traffic Sciences: https://www.fsr-verkehr.de/en/5720-2/

Academic Programme Coordinator: Dipl.-Ing. Kati Ahnert kati.ahnert@tu-dresden.de

Examination and Internship Office: Mrs Katrin Lindner pruefungsamtVW@mailbox.tu-dresden.de

Central Student Advisory: Dr. Antje Beckmann studienberatung@tu-dresden.de

Chair of Air Transport Technology and Logistics: Mrs Damaris Hähne sekretariat-ifl@tu-dresden.de

Organization of the lecture via OPAL: https://bildungsportal.sachsen.de/opal/shiblogin?3

Organization of the Exams via SELMA: https://selma.tu-dresden.de/APP/EXTERNALPAGES/-N000000000000002,-N000169,-AEXT%5Fwelcome%5Fen

Foto: TUD / Sven Döring

Thank you for your attention! Any Questions?