

MASTER'S
Multiple degree,
full-time

Intelligent Transport Systems

Intelligente Verkehrssysteme

> Technology is networking.



Challenges in Transport

The performance of transport systems is of crucial importance for individual mobility, commerce and for the welfare and economic growth of all nations. There are, however, considerable problems to be overcome which can be addressed through the use of Intelligent Transport Systems.

The interdisciplinary master's degree program, jointly offered by the University of Applied Sciences Technikum Wien (UASTW), the Czech Technical University in Prague (CTU) and Linköping University (LiU), was designed to satisfy the growing demand for professionals in modern high-tech transport engineering. The field of Intelligent Transport Systems (ITS) is concerned with the procedures, systems and devices which can enhance transport and mobility of passengers and freight through collection, communication, analysis and distribution of information. In order to design and operate complex and intermodal ITS detailed knowledge in a number of different disciplines is required.

The European Master of Science in Intelligent Transport Systems is offered either as a multiple degree program (with two or three nationally recognized degrees depending on the students' individual mobility track) or as a single degree program. Students have to choose after their first semester their preferred study-paths according to the specializations offered. The final assignment of study paths is made by the consortium (UASTW, CTU, LiU) based on performance and availability. For acquiring a double degree students have to change university after stage 1 or 2. For acquiring a multiple degree students have to change university after stage 1 and have to move to a third university after stage 2.

Facts & Figures

- Organizational structure: full-time degree program
- Degrees: Master of Science in Engineering (MSc) in Intelligent Transport Systems (UASTW), Ing./MSc (CTU), MSc in Transportation Systems Engineering (LiU)
- Language: English
- Program duration: four semesters
- Start: August (LiU), September/October (UASTW and CTU)
- Workload: 120 ECTS credits (30 credits per semester)
- Contact hours: around 20 per week

Admission Requirements

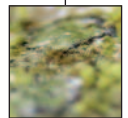
Subject-specific bachelor's degree and/or other recognized academic degree from a technical or natural sciences university of applied sciences or university amounting to at least 180 ECTS credits (including appropriate knowledge of mathematics and programming).

Application

You can apply any time online on our website www.technikum-wien.at or www.em-its.eu. For further information concerning admission procedures and deadlines please contact our administrative assistant.

Acquired Competencies

- Design, analyse and evaluate state of the art ITS by using or developing appropriate mathematical tools (modelling, optimising, statistics, discrete mathematics)
- Understand the application, function and use of technical equipment and technologies for sensing, detecting, positioning, communication and data processing (pre and post); understand the role of ITS for improving the transportation systems; understand and assess the different modes of transportation including intermodal solutions
- Take into account human behaviour and the way it influences the effect of ITS (HMI, traffic psychology, user needs, behavioural response to ITS)
- Consider the connections between transport and environment, transport and economy and transport and land use
- Take into account legal requirements regarding the transport system especially with respect to ITS (safety, interoperability, data protection, liability, environmental aspects)
- Manage ITS projects in an international and intercultural context
- Compare and contrast the advantages and disadvantages of different business concepts (PPP, B2B, B2C, B2A)



Job & Career

A master's degree in Intelligent Transport Systems offers an excellent basis for a wide range of national and international careers. For example, graduates

- work in the field of traffic management and traffic data management,
- work with geographic information systems,
- design sustainable and environmentally friendly traffic concepts,
- work in mobility behavior research,
- work in the field of transport infrastructure maintenance,
- work in the area of transport management in government,
- are sought-after by transport companies (waterways, rail, air or road),
- use their know-how working for transport and traffic providers,
- are employed by producers and suppliers in the automotive industry, or
- use the master's degree as basis for obtaining a doctorate and going into research.

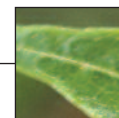
WASU

Curriculum Stage 1

(1st and 2nd semester)

Modules	Czech Technical University in Prague	ECTS credits	UAS Technikum Wien	ECTS credits	Linköping University	ECTS credits
Module 1 Transportation Systems	Analysis and Prevention of Traffic	2	Transportation Systems	3	Transport and Logistics Systems	6
	Energy Analysis of Land Carriage	2	Public Transport	1.5		
	Identification Systems	2	Technologies in Transport	1.5		
Module 2 Intelligent Transport Systems	Telematic Systems and their Design	6	ITS in Railway, Waterway and Airborne Transportation	4.5	GIS for Transportation	6
			Traffic Telematics	1.5		
Module 3 Automated Data Acquisition and Processing	Pattern Recognition	3	Sensorics	3	Computer Networking	6
	Data Processing	3	Algorithms and Data Structures, Soft Computing	3		
Module 4 Specialization in ITS 1	ITS Effectiveness Assessment (takes place in the 3 rd semester)	2	Autonomous Vehicles	1.5	Applied Optimization (takes place in the 3 rd semester)	6
	Advances Telematic Applications / Railway / Interlocking Systems / Vehicle Control Systems (takes place in the 3 rd semester)	2	Embedded Systems	3		
	Safety Critical Applications in Transport / Special Materials and Technology (takes place in the 3 rd semester)	2	Control Theory	1.5		
Module 5 Mathematical Tools	ITS Mathematical Tools	4	Discrete Mathematics	3	Optimization	6
	Theoretical Physics in Transportation	3	Operational Research	3		
Module 6 Required Elective Module	Artificial Intelligence and Expert Systems in Transport	2	Required Elective Module	6	Computer Networking	6
	Intelligent Vehicle and Safety	2				
	Risk Analysis and Management	2				
Module 7 Traffic Modelling and Simulation	Traffic Modelling and Simulation	4	Transport Modelling and Simulation	6	Traffic Planning and Simulation	6
	Traffic Flow Theory	3				
Module 8 Telecommunication	Telecommunications in ITS	3	Telecommunications	3	Mobile Communication	6
	Signals and Codes	4	Mobile Telecommunication and Network Technology	3		
Module 9 Specialization in ITS 2	Control System Theory and Reliability in Transportation	4	Logistics and Fleet Management	1.5	Supply Chain Logistics	6
	Information Security	2	Distributed Dependable Systems	4.5		
Module 10 Specialization in ITS 3	Master's Project 1	2	ITS Project 1 (Select one of the following: Autonomous Driving, Intelligent on Board Sensors for Vehicles, Traffic Data Acquisition, Cooperative Systems)	6	Logistics Resource Planning	6
	Master's Project 2	2				

ECTS credits Credits according to the European Credit Transfer and Accumulation System (student workload required for each course for one semester)



Curriculum Stage 2 (3rd semester)

Modules	Czech Technical University in Prague	ECTS credits	UAS Technikum Wien	ECTS credits	Linköping University*	ECTS credits
Module 11 GIS, Positioning, Navigation and Identification Systems	Geographical Information Localization and Navigation Systems	6	Positioning, Navigation and Identification Systems	3	Positioning Systems	6
			GIS	3		
Module 12 Complex Systems	Systems Engineering	3	Advanced Driver Assistance Systems	1.5	Traffic Engineering and Control	6
			Cooperative Systems	1.5		
	Applied Mathematical Modelling	4	Transport Economy	1.5		
			ITS System Architecture	1.5		
Module 13 Human and Environmental Impacts, Safety and Sustainability	Transport and Environment	2	Safety and Sustainability	3	Traffic Safety Management	6
	Road Safety Audit	2	Traffic Psychology and Human Machine Interface	3		
	Modelling of HMI	3				
Module 14 ITS Management Skills	Technological Aspects and Management of ITS Projects (takes place in the 1 st semester)	2	Law	3	Project Management	6
	Economy and Management of ITS Projects (takes place in the 1 st semester)	3	Management and Leadership Training	3		
Module 15 Specialization in ITS 4	Master's Project 3	4	ITS Project II	6	Analysis of Communication and Transport Systems	6

* The curriculum stage 2 for students moving from UASTW and CTU to LiU comprises the modules 6 (see stage 1), 11, 12, 13 and 15.

Curriculum Stage 3 (4th semester)

Any university of the consortium depending on availability

Modules	Czech Technical University in Prague	ECTS credits	UAS Technikum Wien	ECTS credits	Linköping University	ECTS credits
Module 16 Master's Thesis	Master's Project 4	8	Master's Thesis	18	Master's Thesis	30
	Master's Thesis	22	Graduate Seminar	6		
			Supervision – Master's Thesis	6		



Contact

MULTIPLE DEGREE PROGRAM
Intelligent Transport Systems

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University of Applied Sciences Technikum Wien

With some 8,000 graduates thus far and roughly 3,800 students, the University of Applied Sciences Technikum Wien is Austria's largest purely technical university of applied sciences. The educational offerings consist of 12 bachelor's and 17 master's degree programs, which are offered as full-time, part-time and/or distance study programs. Eight degree programs are taught in English. The educational offerings are based on a solid scientific foundation and are also practice-oriented. At UAS Technikum Wien, emphasis is not only placed on providing a high-quality technical education, but also on subjects with a focus on business and personal development. Close ties and collaborations with business and industry give students and graduates excellent career opportunities. The combination of theory and practice is of central importance in both research and instruction.

Czech Technical University in Prague

CTU in Prague is the oldest technical university in Central Europe. Its Faculty of Transportation Sciences is a leading transport-oriented faculty in the Czech Republic with over 24,000 students in several specialized degree programs who benefit from project-oriented studies which, among others, enable team work on transport projects supervised by experienced specialists.

Linköping University

Linköping University, founded in the 1970s, is renowned for its innovative educational spirit and its long-standing tradition of cross-disciplinary studies and research. With a student population of over 27,000 and 3,900 employees Linköping University is one of the major universities in Sweden, and it has campuses both in the city of Linköping and city of Norrköping.

> www.technikum-wien.at



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