



# **International Programme**

**List of courses taught in English**

## **Logistics Technologies**

**Master degree level**

Academic Year 2019 – 2020

Winter semester

## Logistics Technologies

Course code	Course title	Number of ECTS credits
IDW	Introduction Week	6
S_N_AJL_2	English for Logistics 2	6
S_N_TCL	Technology City Logistics	6
S_N_FLP	Physics in Logistics Processes	6
S_N_AIL	Applied Informatics in logistics	6
S_N_DOL	Transport logistics	6

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# Course descriptions

## Logistics Technologies

### **IDW Introduction Week | Number of credits: 6**

International Programme starts with the Introduction Week. This week is organised for all international students. It is meant as a first introduction to the Czech language and Czech culture. The week will give a possibility for socialising with international and local students.

The output is a presentation and short essay on a given topic. Detailed requirements are to be specified at the beginning of the Week.

### **English for Logistics I (Code: S\_N\_AJL\_1) | Number of credits: 6**

#### *Course objectives*

The aim of the subject is the acquisition of professionally-focused language skills and knowledge in the fields of transport and logistics, including particular grammatical rules in accordance with the descriptor of B2 level of the Common European Framework of Reference for Languages, in all the productive and receptive skills. After successful completion of the course, the graduate has such language skills to be able to describe professionally-oriented situations, express aptly the main essence of the idea or the problem and communicate very well both in spoken and written communications. The graduate can also adopt attitudes to the given topics (see below the syllabus) and using relevant language means, is able to in a relative detail express his/her opinions and viewpoints, discuss the current topics and trends in the fields and apply the theoretical knowledge in practice.

#### *Topics*

1. Introduction to Logistics. Jobs in Logistics.
2. Activities in Logistics. Logistics Services.
3. Selected Logistics Acronyms. Product Ranges.
4. 3PL Providers. Value-Added Services.
5. Inventory Management and Procurement.
6. Continuous Replenishment. Job Advertisements.
7. Modes of Transport.

8. Transport and Handling Equipment.
9. Container Types. Types of Goods.
10. Students' Presentations.
11. Students' Presentations.
12. Revision.
13. Revision.

### **Technology City Logistics (Code: S\_N\_TCL) | Number of credits: 6**

#### *Course objectives*

The aim of the course is to acquaint students with the nature and solution of logistic problems of cities in different concepts of partial solutions to complex approach. Become familiar with the classic concept of city logistics solutions as flows of goods and other materials to the centers of large cities, widespread concept involving all relevant components of transport in the whole agglomeration, the issue of freight and public transport, including its integration as an important part of urban logistics and related logistics and environmental environment. Graduates will be able to identify strengths and weaknesses in transport in towns and cities, can solve the task scheduling and optimization of transport and traffic flows in cities. Able to define and describe the properties of both passenger and freight transport, environment and transport technology, is able to define the basic parameters of a comprehensive solution to the issue.

#### *Topics*

1. The issue of City Logistics.
2. Road Transport world cities.
3. Transport as a system.
4. System approach to urban transport.
5. Definition of transport services.
6. Modeling operation in the transport sector.
7. Prognosis and modeling of transport needs.
8. Creating of the transport process in PTV VISION.
9. Logistics supply chain of freight transport in the city.
10. Technology of the freight transport service in the city.

11. Data collection and analysis permeability.
12. Analysis and modeling of population movements.
13. Connectivity analysis and appropriateness of methods of cartography.

### **Physics in Logistics Processes (Code: S\_N\_FLP) | Number of credits: 6**

#### *Course objectives*

The aim of the course is to get the students acquainted with physical and technical aspects of material and information flows in logistics systems. Graduates demonstrate sufficient knowledge of applied mechanics, physical fields, electromagnetic waves and observation methods of motion of bodies.

#### *Topics*

1. Circular motion in mechanical systems. Forces in curvilinear motion. Centrifugal regulators. The principle of dynamic sensor. Torque and angular momentum. Work as a trace effect of the force. Impulse of force as a time effect of the force. Momentum and impulse during rotational movement. Force transfer in couplings and gearboxes.
2. Moment of inertia. Flywheels and their practical use. Free flywheel, Maxwell flywheel, gimbal. Heavy flywheel, its precession and nutation.
3. Gyroscopic effects in transport equipment in curves (aircraft, ship, rocket). Gyroscopic effects in multiple- and single-rail vehicles. Stabilization of flying discs and missiles.
4. Four laws of thermodynamics. Carnot efficiency. The conversion of thermal energy into mechanical one.
5. Gravitational field. Intensity and potential of gravitational field. Movements in the Earth gravity field.
6. Electrostatic Field. Intensity and potential of electrostatic field. Electrostatic field of charged conductors.
7. Electric current. Conductors, insulators and semiconductors.
8. Magnetic field of permanent currents. Magnetic circuits. Generation of the AC voltage in a rotating loop.
9. Closed and open electromagnetic oscillator. Electromagnetic waves generation and propagation. Classification of electromagnetic waves.
10. Light as electromagnetic waves and corpuscular radiation. Coherent sources. Light interference. Diffraction by the opaque edge, slit and grating. Light polarization, birefringence and its use in practice.
11. Photon energy, mass and momentum. Einstein's equation of photoelectric effect. Wave-particle dual nature of light.

12. Coherent and incoherent sources for optical communication systems. Detectors of radiation. Optical fiber and planar waveguide structures.
13. Signal transmission by optical fiber. Optical signals processing. Information transfer in atmosphere and other dielectric environment. The principle of satellite Earth observation.

### **Applied Informatics in Logistics (Code: S\_N\_AIL) | Number of credits: 6**

#### *Course objectives*

The aim of the course is to give students the tools for utilization of the methods and information technology in logistic operations, acquaint students with the possibility of solving the logistics activities, explain how to use the logistics information system to practical steps within the proposal and management of logistics processes. The graduate of the course: • is capable to analyze the available information, utilize the information system as a strategic element of logistics and use the simulation techniques, • demonstrates the basic knowledge of the logistics information analysis and can utilize the optimization methods in logistics systems for their management, • can describe, select and use the tools in the form of statistical methods application, operational methods and evaluation methods in logistics.

#### *Topics*

1. Systems and their basic terms in the context of logistics
2. Description of the characteristics of informatics, information systems and information technologies
3. Fundamentals and systematic approach in the context of integrated logistics
4. Models of information systems in terms of logistics, requirements for information systems and their importance in the context of logistics
5. Models of logistics information systems architecture and their approaches
6. Models of enterprise logistics systems
7. Proposal of systems for the warehouse logistics information system
8. System methodology of logistics information systems
9. Informatics in the context of supply chain
10. Applied Informatics in the context of automatic identification
11. Applied Informatics in passenger transport
12. Applied Informatics in the context of production logistics, geographic information systems
13. Informatics and logistics technologies

### **Transport Logistics (Code: S\_N\_MPS) | Number of credits: 6**

#### *Course objectives*



The aim of the course is to acquaint students with problems of transport logistics and its relationship to marketing, to apprise them with the different modes of transport, a combination of different modes of transport and other transport options. The student can describe the basic concepts and approaches used in logistics, describe the problems associated with transport costs, performance measure in the transportation, international aspects of transport, the main activities in the field of transportation for shippers and carriers, classify traffic management and identify key technologies and the importance of information.

### *Topics*

1. Introduction to transport logistics
2. Legislation in transport, European Transport policy, Transport policy in Czech Republic
3. Characteristics of carriers and transport services
4. Transport infrastructure in the Czech Republic
5. Transport infrastructure in Europe
6. The provider of transportation services
7. Intermodal transport systems
8. Management of Transport, decision-making of the mode of transport
9. Road transport technologies
10. Railway transport technologies
11. Air transport and water transport technologies
12. Logistics centers and their connection to transport systems
13. Transport Logistics and Environment