

# Assoc. prof. Matevž Obrecht, PhD

Vice-Dean of the Faculty of Logistics

# Some general info

Asist. Simona Šinko

## Communication

- When communication with pedagogical or support staff, please keep in mind that you should follow basic communication etiquette.
- Especially in written communication (email, MS Teams):
  - Present yourself with your full name,
  - Write which study program you're taking and which year,
  - Write which class you're talking about
  - Send the email from your @student.um.si mail address.

# AIPS

- <u>https://aips.um.si/en/PrijavaEN.aspx</u>
- You can check exam dates here
- Apply at least 7 days before exam
- Cancel the application no later than 2 days before the exam

aips.um.si/en/PrijavaEN.aspx		
University of Maribor		Log in
Office hours	Login	
Exam dates	Log in with your digital identity. <u>More</u>	
e-Learning	Login trouble? <u>More</u>	
Final thesis submission	Username Password	
Study courses catalogue	Login	
My UM		

**Blended study at FL UM** 

- A combination of in-person teaching and online classroom activities.
- Online classroom activities are a major part of the pedagogical process at FL UM and are obligatory!

• Example of syllabus :

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Clinical training	Druge oblike študija Other forms of study	Samost. delo Individual work	ECTS
18 e-P 27 a-P		A         EV         LV         R           V         15         25			155	8

Predavanja Lectures	Seminar Seminar	т	Vaje utoria	al	Klinične vaje Clinical training	Druge oblike študija Other forms of study	Samost. delo Individual work	ECTS
21 a-P 24 e-P		AV 18	EV 24	LV 3			150	8

# Online classroom – UM eŠtudij

## Online classroom – UM eŠtudij

- <u>https://estudij.um.si/</u>
- Can be switched to English
- Instructions for moodle:
- https://estudij.um.si/pluginfile.php/527807/block\_ht ml/content/Moodle%20Instructions%20for%20Stude nts-2019.pdf



English (en)

τJN

Domov

Slovenščina (sl)

Accessed with your @student.um.si identity.

- All assignments, e-lectures, e-tutorials etc. are given here, as well as materials
- All assignments have to be submitted via the online classroom!
- Can also be used for communication e.g. forums.
- It also contains a plagiarism checker.



## LIBRARY FL UM

## Tjaša Marovt



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2022 © IZUM. All rights reserved.   1	Slovenščina   English erms of use   Privacy policy   Cookies   COBISS   mCOBISS Version 12.2.0, rel: 10.11.2022	<b>Library sign up</b> - Univerza v M	lariboru, Fakulteta za logistiko <sup>Library Rules</sup>
		All the data is mandatory.	
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		Students that have a digital identity can register in their university's libra	1. Login with a digital identity
		online. The registration includes the following MANDATORY steps:	ArnesAAI
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		2. Setting a password for the My library service	You must log in with a digital identity before
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Password: xxxxxx (same as for My library service)

After the registration is completed successfully, the display shows your data and the library membership card number, which can also be used for the *My library* service along with the student card number. The *My COBISS Profile* is also created during the registration.

You can continue to search the catalogue of libraries or register in the My COBISS Profile. If you select the option ArnesAAI for registering in the My COBISS Profile. the option My Libraries shows all libraries, where you are registered as a student.

If the registration was not successful, contact the library.

## ADZ, UM:NIK, DLUM (DKUM)

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## Browzine, Biblos, BSF...



## Guidelines for paper writing

- Proper use of sources and literature
  - Citation style: APA
- Citation tools: Endnote, Mendeley, Zotero
- Citing vs. quoting
- <u>Plagiarism</u>, <u>Copyright</u> (UKM guides)

# Written assignments

Asist. Simona Šinko

### Instructions for written papers

### https://fl.um.si/en/study/final-thesis-guidelines/

University of Maribor Faculty of Logistics		ABOUT	STUDY	RESEARCH	INTERNATIONAL EVENTS	CONTACTS
INFORMATION FOR INTERNATIONAL STUDENTS	Final Thesis Guidelines					
STUDY PROGRAMMES	Guidelines on the Preparation of Written Papers at the Faculty	of Logistics of	the University	of Maribor		Prenesi $\downarrow$
STUDENT AFFAIRS OFFICE	Joint Guidelines for the Preparation of Final Theses					Prenesi $\downarrow$
FINAL THESIS GUIDELINES	Instructions on the Preparation and Submission of the Electro	nic Form of Fin	al Theses			Prenesi $\downarrow$
	Title of written assignment					Prenesi $\downarrow$



# Formatting guidelines



- Preventing plagiarism and giving credit for work!
- Quotation vs. citation
- All sources used in-text must also be given in the final reference list and vice versa.
- Every time you use an idea, information, data, picture etc. that is not the direct result of your own work, you have to cite your source. In-text citing means that you cite the source directly in the sentence or paragraph where that information is given

## Example of scientific papers

In-text citation: The importance of early childhood education has been widely discussed (Johnson, 2018).

Reference citation: Johnson, E. K. (2018). The role of early childhood education in cognitive development. *Child Development Perspectives*, 12(3), 165-170. doi: 10.1111/cdep.12292

## Example of a book

In-text citation: The history of transportation systems has been shaped by a range of technological advancements (Sperling & Gordon, 2009). Reference citation: Sperling, D., & Gordon, D. (2009). *Two billion cars: Driving toward sustainability*. London, UK: Oxford University Press.

## Example of a web page

### In-text: (»OBD GPS Logger«, n.d.)

Reference citation: OBD GPS Logger. Found on 18 June 2013 at the following web address: http://icculus.org/obdgpsl ogger/

## **Navigating Academic Success:** Exams and Advancement Criteria

Valerija Kotnik Student Affairs Office A total of **6 exam attempts are available**, with a limit of **3 per year**.

Attempts 4, 5, and 6 are subject to a fee.

Ensure **exam registration is completed 7 days prior** to the exam via AIPS.

**Deregistration from the exam is possible up to 2 days before**, using AIPS.

**REGISTRATION AND DEREGISTRATION – ONLY THROUGH AIPS**.

FAILURE TO DEREGISTER ON TIME RESULTS IN A BAN FROM ATTEMPTING THE NEXT EXAM DATE





### **Criteria for Advancing in Your Studies**

Bachelor's degree programme – University study programme System Logistics

To 2<sup>nd</sup> year

Students advance to the 2nd year if they obtain at **least 46 ECTS** with the completed obligations of the 1st year, and fulfil the obligations in the following subjects:

- Mathematical Methods 1,
- Management of business processes in resilient supply chains,
- Operations research in logistics and
- Mechatronics systems in logistics.

For students retaking the 1st year, the **same conditions** apply for advancement to a higher year of study as for students who regularly advance to a higher year. For students who continue their studies after an interruption, the **same conditions apply for advancement** to the 2nd year as to students who regularly advance to the 2nd year.



### **Criteria for Advancing in Your Studies**

Master's degree study programme **System Logistics** 

To 2<sup>nd</sup> year

Students advance to the 2nd year if they obtain at least 38 ECTS with the completed obligations of the 1st year, and fulfil the obligations in the following subjects:

- Managing supply chains of the future,
- Smart and safe mobility,
- Quantitative methods and models in logistics systems.

For students retaking the 1st year, the **same conditions** apply for advancement to a higher year of study as for students who regularly advance to a higher year. For students who continue their studies after an interruption, the **same conditions apply for advancement** to the 2nd year as to students who regularly advance to the 2nd year.

### **Progressing to the Next Year WITHOUT Meeting Criteria**

A student who has **not fulfilled all the requirements** for advancement to a higher year may exceptionally be granted admission to a higher year by the Academic Affairs Committee of the Faculty of Logistics of the University of Maribor upon student's application in accordance with Article 85 of the Statutes of the University of Maribor, subject to the following conditions:

- student has not been able to fulfil the requirements for justified reasons; and
- student has **fulfilled the requirements of the previous years and the requirements of more** than 30 ECTS of the year in which student is enrolled, and
- student has **fulfilled the obligations which the Faculty determines that need to be fulfilled** and it is expected that the student will fulfill them.

Exceptional conditions, adopted by the Senate of the FL UM, which apply only to students enrolled for the first time in the 1st year of a master's and Bachelor's degree study program (University degree programme) in the academic year 2023/2024:

Students enrolled for the first time in the first year of a Bachelor's or Master's degree programme, part-time study in English language, in the academic year 2023/2024, who, due to exceptional circumstances (e.g. acquisition of a temporary residence permit in a summer semester), submit an application to the Academic Affairs Committee, will: 1. Advance to the next year if they achieve at least 30 ECTS credits.

2. Renew their student status if they complete at least 1 subject in the current academic year (at least 3 ECTS credits).

Students who do not complete any exam (finish the year with 0 ECTS points) will not have their status renewed, regardless of the desicions adopted at other faculties of the University of Maribor.

## **Sculpting Your Academic Journey** Choosing Your Modules

Assist. prof. Tina Cvahte Ojsteršek, PhD Teach. asist. Primož Bencak

## Presentation of **University programme modules**

# Economic module

## Technical module

# Economic module

The module focuses on sustainable supply chains, intralogistics and project management, as well as logistics in specific systems.

### **Courses:**

- Establishment and assessment of sustainable supporting chain of sustainable supply chain audit
- Intralogistics and project management
- Logistics in specific environments

# Description of courses

#### ESTABLISHMENT AND ASSESSMENT OF SUSTAINABLE SUPPORTING CHAIN OF SUSTAINABLE SUPPLY CHAIN AUDIT

- Environmental legislation, standards and the state's role in promoting green logistics;
- The importance of integrating sustainable development into organizations and SC;
- Use of alternative energy sources and green technologies in sustainable SCs (carbon footprint and its reduction).

#### **INTRALOGISTICS AND PROJECT MANAGEMENT**

- Project and strategic management and dimensions of project work in intralogistics (managing integration, scope, time, cost, quality, people, communication, risk and procurement);
- Project life cycle, phases and process approach;
- Knowledge areas for project planning, project launch documents, organizing and monitoring.

#### LOGISTICS IN SPECIFIC ENVIRONMENTS

- Logistics in tourism, agriculture and healthcare;
- Postal logistics, event organization logistics, sports logistics.

# Technical module

The module is focused on planning and management of logistics systems, project management and intralogistics, as well as management of packaging and relief logistics.

Courses:

- Planning of packaging and reverse logistics
- Planning and management of logistics systems
- Intralogistics and project management

# Description of courses

#### **PLANNING OF PACKAGING AND REVERSE LOGISTICS**

- Functions of packaging, use of individual packaging materials, the process of relief logistics, waste management;
- Modern packaging materials and innovations, packaging design, planning, testing, 3D modeling and printing;
- Packaging labeling and GS1 standards.

#### PLANNING AND MANAGEMENT OF LOGISTICS SYSTEMS

- Effectiveness of the existing intralogistics system based on the analysis of the existing material supply system.
- Configuration of material flow support in the production system based on capacity requirements;
- Planning the material supply system of the production system.

#### **INTRALOGISTICS AND PROJECT MANAGEMENT**

- Project and strategic management, dimensions of project work in intralogistics (integration, scope, time, cost, quality, people, communication, risk and procurement);
- Project life cycle, phases and process approach;
- Knowledge areas for project planning, project launch documents, organizing and monitoring.

# Presentation of Masters' programme System Logistics

## Which module should I choose?



Masters' degree Logistics System

# E conomic module

# Technicaltechnological module



# Economic module

The focus of the MAG economic module is on the managerial skills needed to manage supply chains with an emphasis on the international component and digitization. The study provides an insight into the functioning of the digital society of the future, and you will gain management skills and business communication skills in different cultures.

The study is also related to the introduction of strategic changes and the creation of new innovative business models with advanced management tools, as well as the integration of new trends in sustainable consumption and production, as well as digitization in the renewal of the company. Last but not least, knowledge of models for economic assessment of the efficiency of OV and research in the field of simulation and optimization of sophisticated logistics systems.

## **CREATING SUSTAINABLE BUSINESS CONCEPTS IN LOGISTICS COMPANIES**

- Sustainable business models on the example of logistics companies (Specifics of the development of start-ups in logistics, Examples of innovative business models)
- change management (introduction of strategic changes in logistics companies, change management in the introduction of green technologies, identification of new business opportunities in the field of sustainable logistics)
- CANVAS business model
- Environmental standards and concepts (ISO, Green SCOR, integration of digitization, sustainability and business improvements throughout OV
- Sustainable consumption and production (Strategic wheel of ecodesign, Preparation of the concept, strategies and activities of ecodesign for implementation in a logistics company

## **DIGITAL SOCIETY AND LOGISTICS**

- Digitisation of smart cities
- Digital society
- Modern trends in the digital society
- Frameworks and legislation for the functioning of the digital society

### **INTERNATIONAL LOGISTICS**

- Concepts of international logistics
- International supply chain management
- Global commodity flows
- Incoterms clauses and other international documents
- Logistics processes in an international environment
- International logistics infrastructure
- International transport
- International trends

### MATHEMATICAL MODELS AND METHODS IN BUSINESS LOGISTICS SYSTEMS

- Basics of econometrics
- Sustainable modelling in the optimisation of international commodity flows, stocks and transport
- Inventory management and costs (deterministic and stochastic models for inventory management, link to demand forecasting
- Models for the need of analyzing the efficiency of companies and organisations
- Basic concepts of financial modelling, statistical risk management and decision theory with uncertainty in logistics systems

### **COMMUNICATING IN LOGISTICS AND SUPPLY CHAIN**

- Communication processes and models
- Organisational communication (internal communication, external communication, importance of both in logistics and supply chains)
- Communication and relationships in supply chains (importance of communication in supply chains, factors of building relationships in supply chains)
- Marketing communication (definition of marketing communication, models of marketing communication, the importance of marketing communication in supply chains)
- Crisis communication (crisis communication in logistics and supply chains)
- Multicultural communication (Hofstede's dimension of cultures and connection with intercultural communication)

### **SUPPLY CHAIN ECONOMICS**

- Value chains in logistics (definition of value chain, value chain model).
- The cost aspect of logistics processes (logistics costs, cost functions).
- Economic efficiency and effectiveness (financial statements, assessment of economic efficiency and effectiveness of the supply chain).
- Economics of logistics investments (types of logistics investments, economic models of investment assessment, decision models).
- Models of charging for the use of logistics infrastructure (costs of logistics infrastructure, charging models, effectiveness of models).

## Technicaltechnological module



## Technical-technological module

The focus of the technical-technological module of the Master's program is on the engineering skills needed to manage technological changes with an emphasis on robotization, circular economy technologies and mobility systems.

You will receive knowledge from the fields of:

- mobility systems (e.g., traffic flows, traffic safety).
- comprehensive management information systems (e.g., ERP),
- robotic and automated systems,
- technical and technological solutions for smart factories,
- modern storage systems and strategies,
- industrial ecology and circular economy with an emphasis on LCA
- advanced optimization methods and mathematical modeling.

Source: https://www.istockphoto.com/photo/smart-factory-equip-with-agvs-3d-printers-and-robotic-arm-gm901810754-248786709



Name	ECTS	Course coordinator
Technological support in mobility systems	6	red. prof. Darja Topolšek
Logistics information systems integrations	6	izr. prof. dr. Roman Gumzej
Modelling of intralogistics systems	6	red. prof. dr. Tone Lerher
Technologies and innovation for circular economy	6	red. prof. dr. Rebeka Kovačič Lukman
Robotic systems in logistics	6	red. prof. dr. Tone Lerher, doc. dr. Darko Hercog
Theory of optimization and modeling design in smart logistics systems	6	izr. prof. dr. Dejan Dragan

### **TECHNOLOGICAL SUPPORT IN MOBILITY SYSTEMS**

- Technological solutions in smart communities and intralogistics (technological architecture, telematics, smart city technologies in connection with infrastructure)
- Distribution strategies in smart communities and supply chains and the necessary technological support (distribution systems in cities, planning and operation of transport terminals and hubs)
- Traffic flow modeling and simulations with dedicated software and traffic flow management strategies
- Monitoring the performance of smart communities and mobility within them
- Modern technologies in traffic safety (influences on the driver while driving with an emphasis on visual attention, sensors and technologies in the infrastructure, assistance systems in vehicles)

### **LOGISTICS INFORMATION SYSTEMS INTEGRATIONS**

- Understand the integration of Logistics Information Systems (LIS)
  - Horizontal and vertical integration of LIS
  - Automation pyramid (ERP-MES-PCS)
  - Optimizing SCM through integrations
  - Global interoperability standards and protocols
- Master the methods of implementing comprehensive management information systems (ERP)
- Master the techniques of planning logistics operations
  - Capacity planning
  - Dispatching and scheduling
  - Evaluation of rankings based on key performance indicators

### **Computer-aided logistics information systems**

integration of logistics information systems (LIS) ANSI ISA-95

### **Comprehensive management information systems (ERP)** implementation of ERP systems

management and tuning of ERP solutions

### The LIS Automation Pyramid

Process Control Systems (PCS) Manufacturing Execution Systems (MES)

### Planning of logistics operations

scheduling and sorting with time, technology and resource constraints performance analysis of rankings

### Global standards and interoperability protocols













• Industrial and collaborative robots:

basic components, configurations, grippers, development tools, robot programming, robotic orderpicking.

• Autonomous and automated vehicles:

configurations, sensors, actuators, safety laser scanners, robotic operating system (ROS), location systems, navigation systems, central control systems.

• Unmanned aircraft (drones):

use of unmanned aircraft in logistics, aircraft configurations, sensors, actuators, location systems, navigation systems, ground control systems, legislation.







### **MODELLING OF INTRALOGISTICS SYSTEMS**

Courses



## **MODELLING OF INTRALOGISTICS SYSTEMS**

- Intralogistics
- Smart factories and smart warehouses
- Layout planning
- Automated warehouse systems and mobile robots to support orderpicking
- Simulation modeling of transport and storage systems in intralogistics



### **TECHNOLOGIES AND INNOVATION FOR CIRCULAR ECONOMY**

- Industrial ecology and the circular economy
- the concepts of analogies of the techno-biosphere
- industrial ecology
- life-cycle principles
- eco-planning of products and processes

### • Materials science and engineering to support the circular economy

- materials and their properties, with an emphasis on polymers and reuse options
- critical raw materials

### • Circular economy in smart cities:

- the flow of matter and materials in the system of cities
- innovative business/service processes
- designing efficient and successful services
- reverse logistics
- alternative solutions with reduced environmental impact
- Evaluation of the life cycle processes of products and services as support in decision-making
  - LCA, LCC and S-LCA in logistics processes

### THEORY OF OPTIMIZATION AND MODELING DESIGN IN SMART LOGISTICS SYSTEMS

### • Optimization of smart logistics systems and optimization models

(continuous and discrete, design variables, one- and multiple-object function optimization, constraints, modeling of optimization problems and optimization models, numerical tools).

### • Classic and modern optimization methods and algorithms

(exact methods, approximation methods, heuristic algorithms, problem-specific heuristics, meta-heuristics, genetic algorithms, ant colony, simulated cooling).

• Statistical regression models and time series forecasting in smart logistics systems (regression models, models of linear and non-linear time series, hybrid models, the problem of choosing optimal models, use of appropriate numerical tools, forecasting in smart systems).

## Mathematical modeling of traffic flows in smart logistics systems

(macroscopic stream models, stationary flow models, macroscopic continous traffic models, congestion and bottleneck modeling, mass service and queues in traffic modeling).

# How do you make a selection?

### The module selection will be carried out via **Moodle in May 2024.**

Students who do not make e-module selections and also do not select subjects/modules at other UM members (as part of electives), will have them assigned by the Committee for Study Affairs at the Faculty of Logistics, University of Maribor.

## My Journey Dona Johns Joseph (*Student Tutor*)

