UNIVERSITY NORTH, UNIVERSITY CENTRE VARAŽDIN, DEPARTMENT OF LOGISTICS AND SUSTAINABLE MOBILITY

Graduate study program in Sustainable Mobility and Logistics Management (Master program)

List of courses that can be delivered in English, including learning outcomes and course coordinators qualified to teach them in English. Teaching is conducted in the form of consultations.

1st semester (winter semester)

Methodology of Scientific Research - 5 ECTS
(course coordinators: Nikola Mrvac, Krunoslav Hajdek)

- Evaluate, analyze, and compare different data and information related to the OMIL study field and assess their relevance.
- Evaluate types and methods of scientific research, fundamental methodological concepts, and research paradigms, and apply them in research activities and academic writing in other OMIL study courses.
- Design a research outline, select appropriate research methods, conduct research, apply research methods, and write a seminar paper using the acquired knowledge.
- Evaluate professional and scientific papers and use their content and findings when designing and conducting one's own research activities.
- Evaluate acquired competencies when writing seminar papers in other OMIL study courses and independently design and conduct simpler scientific research.

Sustainable Regional and Urban Mobility - 5 ECTS
(course coordinators: Ljudevit Krpan, Ivan Cvitković)

- Understand and apply fundamental concepts of road and railway transport infrastructure, as well as basic traffic operation performance indicators.
- Identify, analyze, and evaluate strategic transport development documents at different governance levels.
- Design and implement a comprehensive and systematic transport planning process at the level of functional regions and urban areas, in accordance with prescribed planning methodologies.
- Collect, structure, and process data on the current state of the transport system, with particular emphasis on organizing and conducting basic (field) traffic surveys.
- Critically assess, design, evaluate, and combine implementation measures of major transport system development plans for functional regions and urban areas in line with principles of sustainable development.

Regional Development and EU Funds - 5 ECTS
(course coordinators: Ljudevit Krpan, Ivan Cvitković, Ivona Huđek Kanižaj)

- Understand EU cohesion policy, explain the EU Multiannual Financial Framework, and identify available EU funds for non-refundable (co-)financing of projects.
- Explain the comprehensive process of regional and local development planning systems.
- Explain the methodology for preparing strategic development documents.
- Analyze, identify, and evaluate strategic development documents at different governance levels.
- Apply models for measuring and assessing national, regional, and local levels of development.

Operations Research - 5 ECTS
(course coordinators: Damir Modrić, Sanja Zlatić)

- Identify problems in the field of sustainable mobility and logistics that can be solved using linear programming methods and techniques.
- Model and solve linear programming problems using graphical and simplex methods, as well as by applying MS Excel.
- Apply methods for solving transportation problems in the contexts of sustainable mobility and logistics.
- Define basic concepts of graph theory.
- Describe and apply network planning methods in the contexts of sustainable mobility and logistics.

Computer Simulations in Transport and Logistics - 5 ECTS
(course coordinators: Ljudevit Krpan, Ante Klečina, Fitim Kurti)

- Understand simulation modeling approaches in transport and logistics.
- Recognize the importance and role of simulation methods in transport and logistics.
- Apply information systems for the efficient use of simulation software.
- Develop simulation models and perform their verification.
- Understand the analysis of output data generated by simulation models.

Fleet Management - 5 ECTS
(course coordinators: Miroslav Drljača, Ivica Kaniški)

- Understand the role and importance of transport and traffic in the Croatian economy.
- Model and manage vehicle fleets based on principles of quality and sustainable development.
- Manage vehicle fleets through planning, organizing, decision-making, human resource management, and control.
- Understand fleet and yard management systems.
- Understand quality management systems in fleet operations.

2nd semester (summer semester)

Spatial Transport Planning - 6 ECTS
(course coordinators: Ljudevit Krpan, Ivan Cvitković)

- Rank different levels of spatial planning documents.
- Assess the objective spatial possibilities for planning and locating transport infrastructure within spatial planning documents.
- Propose optimal transport solutions in accordance with transport needs and spatial conditions, based on the levels of spatial planning documents.
- Develop optimal spatial-transport solutions.
- Evaluate individual spatial-transport solutions and justify the selected optimal solutions.
- Critically assess the interrelationship between spatial and transport solutions, particularly in urban areas.

Strategic Management - 6 ECTS
(course coordinators: Krešimir Buntak, Ivana Martinčević)

- Assess presented situations quickly and accurately by identifying core problems and/or questions, and evaluate management strategies considering the environment, top management values, social expectations, financial position, and other relevant factors.
- Analyze facts to identify opportunities and threats in the environment, as well as strengths and weaknesses within the organization, in order to evaluate managerial behavior and/or prepare situational analyses useful for formulating, evaluating, and implementing policies and strategies.
- Identify strategies suitable for each situation and evaluate alternatives based on relevant criteria, including top management values, social expectations, internal finances, production and technical capabilities, and more.
- Recommend specific courses of action using, when appropriate, detailed strategies and plans, considering organizational changes, financial requirements and implications, timelines, and human relations.
- Sharpen analytical skills required in functional areas—production, finance, marketing, operations research, human resources, etc.—when addressing organization-wide problems.
- Demonstrate the ability to write a case study according to provided guidelines, conduct literature research on the topic, use available literature, and present and defend positions effectively.
- Connect theory and practice by developing an understanding of management tools and their limitations, and applying this understanding to solve problems in specific organizational situations.

Urban Traffic Systems Management - 6 ECTS
(course coordinators: Ljudevit Krpan, Ante Klečina)

- Analyze and critically assess the efficiency of traffic system management in urban areas.
- Recommend methods and tools to improve traffic flow management depending on specific conditions.
- Develop strategies for managing traffic flows in urban environments.
- Classify spatial and temporal factors affecting transport demand.
- Assess internal and external travel costs.
- Define operational strategies for managing traffic systems and optimize the system according to the established strategy.

Smart Cities and Urban Logistics - 6 ECTS
(course coordinators: Saša Petar, Fitim Kurti)

- Understand, recognize, and describe key urbanization trends and principles of sustainable urban development.
- Evaluate, identify, describe, and critically investigate the fundamental factors of smart cities and urban logistics.
- Analyze, list, summarize, apply, and explore new technologies used in urban environments (e.g., Internet of Things, Big Data, Blockchain).
- Understand, recognize, and describe key trends in urban logistics.
- Create, propose, select, develop, and implement strategies for urban logistics development.
- Apply acquired knowledge, experience, and skills in new situations arising from the development of smart cities and urban logistics (e.g., last-mile delivery).

Intelligent Mobility - 6 ECTS
(course coordinators: Goran Kos, Ljudevit Krpan, Ivan Cvitković)

- Define system requirements for individual components of intelligent transport systems (ITS).
- Define parts of the ITS architecture and participate in its development.
- Analyze the effects of applications and services in the field of intelligent mobility.
- Select appropriate technologies for implementation in specific functional areas of intelligent transport systems.
- Conduct evaluations of individual solutions within intelligent transport systems and related technologies.
- Analyze individual ITS solutions throughout their lifecycle.
- Participate in teamwork to solve complex ITS-related problems alongside other disciplines (electrical engineering, computer science, telecommunications, mechanical engineering, etc.).

Supply Chain Management - 6 ECTS
(course coordinators: Saša Petar, Fitim Kurti, Maja Matajčić)

- Define key concepts in supply chain management.
- Analyze factors affecting supply chains.
- Differentiate processes and outcomes in supply chain management.
- Identify and investigate users of innovations in creative industries.
- Analyze the role of supply chain management in the market.
- Connect and compare supply chain management topics over time to gain knowledge and project future trends.

Sustainability and Corporate Social Responsibility - 6 ECTS
(course coordinator: Vesna Sesar)

- Understand the term and concept of sustainable development, its main components, and the fundamental goals of sustainable development as presented through Agenda 2030.
- Understand the term and concept of corporate social responsibility (CSR), its main principles, and connect the concepts of CSR and sustainable development.
- Assess progress in achieving sustainability goals using sustainability tools, measures, and indicators.
- Identify and evaluate the impact of stakeholders in the context of sustainable organizational management.
- Explain frameworks and methodologies for non-financial reporting.

- Explain the role of sustainability and CSR in strategic management and recognize the key strategic documents of sustainable development.

Sustainable Logistics Systems - 6 ECTS
(course coordinators: Saša Petar, Miljenko Mustapić, Fitim Kurti)

- Identify sustainability issues in logistics systems.
- Describe the organization of a logistics system.
- Present collected data on different types of logistics services.
- Analyze relevant sustainability indicators of logistics systems.
- Independently present the current state and future perspectives of logistics system sustainability.
- Recognize the need for lifelong learning within the logistics system.

3rd semester (winter semester)

Business Analysis - 6 ECTS
(course coordinator: Ivana Martinčević)

- Understand the complexity of the interaction between operational business activities and the strategic positioning of a company.
- Sharpen analytical skills required in business analysis for company management and decision-making processes.
- Analyze the company's status, justify findings, draw conclusions, and provide recommendations for further business development.
- Apply procedures and tools to assess and evaluate the company's achieved development.

Project Management and Evaluation - 6 ECTS
(course coordinators: Ljudevit Krpan, Ivan Cvitković)

- Theoretically and practically understand all fundamental components, processes, and methods/techniques of project management and correctly interpret key theoretical and practical project management concepts.
- Differentiate project management processes (strategic preparation, selection of the optimal model, implementation, and control).
- Understand (comparatively) the applicability of project management functions, tasks, goals, and work quality of the project leader, team leader, and other key project participants and their roles.
- Fundamentally understand the managerial applicability of organizational structures for team work in designing and constructing a planned system.
- Understand financial and economic project analysis, including sensitivity and risk analysis of project implementation.
- Identify and manage project risks.

Organization of Parking in Urban Areas - 6 ECTS
(course coordinator: Robert Maršanić)

- Define basic terms and concepts in the field of parking, describe the role of parking in urban areas, outline the main characteristics of parking policy, and list types and forms of parking spaces, on-street and off-street parking, types of parking garages, and related services.
- Explain methods for determining parking supply. Calculate the required number of parking spaces based on a given area or facility. Forecast future parking demand for a specific area or near a particular facility.
- Apply Croatian and European legal regulations and standards for the dimensioning and design of parking facilities.
- Analyze the current state of the parking system in a specific area, settlement, or facility and provide a critical review. Design, calculate, and describe a parking system for a given area, settlement, or facility based on the latest scientific and professional findings, traffic engineering principles, and applicable laws and regulations.
- Prepare a feasibility study for a parking garage or parking location.
- Draw conclusions regarding the quality of a specific solution within the parking system or related service and utility facilities in transport.

Transport and Environment - 6 ECTS
(course coordinator: Siniša Vilke)

- Analyze the environmental and natural impacts of each transport mode.
- Analyze and assess the external costs associated with each transport mode.
- Propose measures to reduce the impact of transport and transport infrastructure on the environment and nature.
- Evaluate individual transport solutions to ensure better living conditions for residents while meeting transport needs.
- Respond in a timely manner and participate in the preparation of strategic environmental assessments and environmental impact studies in the transport domain.
- Classify the effects of specific transport solutions on people and the environment.
- Explain the procedures for conducting environmental impact assessments, strategic environmental assessments, and assessments of interventions on nature and landscape.
- Participate in these procedures in various capacities: as a preparer of an environmental impact study (EIS) as an expert basis; as a member of an advisory expert committee evaluating the EIS; and as an official in administrative bodies responsible for environmental impact assessment procedures.

Regional and Urban Public Passenger Transport - 6 ECTS
(course coordinators: Miroslav Drljača, Ante Klečina)

- Analyze and model public urban passenger transport (JGPP) systems in urban areas.
- Rank existing JGPP systems in urban environments.
- Propose improvements and rationalization measures for the organization of JGPP.
- Integrate different passenger transport systems into a unified, complementary system.
- Develop a JGPP line network and optimize line capacities through network rationalization, line adjustments, or managing vehicle frequency and capacity on individual lines.
- Evaluate passenger transport services and propose enhancements.
- Identify and recommend transport policy measures that encourage the use of JGPP.

Business Process Management in Logistics - 6 ECTS
(course coordinators: Krešimir Buntak, Branimir Buntak, Viktorija Adamić Ciglar)

- Define a business process and the process structure of an organization.
- Interpret the elements of a business process, their significance, and their role.
- Identify, define, map, and document a process using the IDEF0 methodology.
- Explain methods and tools for business process management.
- Apply and differentiate tools for managing business processes in problem analysis.
- Demonstrate the ability to write a paper according to the provided seminar instructions.
- Conduct literature research on the topic, utilize available literature, and demonstrate presentation skills.
- Differentiate and interpret the distinction between a process and a project.

Human Resource Management - 6 ECTS
(course coordinators: Ana Globočnik Žunac, Lana Miletić)

- Understand and describe the concepts within human resource management and the fundamental processes carried out within this framework.
- Independently conduct job analysis, planning, and forecasting of needs within human resource management.

- Understand the principles of selection and make independent decisions in the process of selecting human resources.
- Conduct effective internal communication to support human resource management.
- Analyze the motivation system, find solutions to employee motivation issues, evaluate employee performance, and assess work quality.

Management of Logistics and Distribution Centers - 6 ECTS
(course coordinator: Miroslav Drljača)

- Understand the basic concepts related to logistics and distribution centers (LDCs) and their operations.
- Understand the business processes that occur within LDCs.
- Be able to analyze and design value-added services of an LDC.
- Be able to determine the type, location, and calculate the capacity of an LDC.
- Understand the concepts of LDC construction and their significance for the economy.
- Be able to model environmentally sustainable LDC processes and identify and implement measures to improve LDC operations.

City Management and Urban Economics - 6 ECTS
(course coordinator: Krešimir Buntak)

- Explain the concept and characteristics of an urban system and clarify the process, level, and consequences of urbanization.
- Understand and interpret theories of city growth and development, and assess urban economic growth using methods and indicators for measuring city growth.
- Understand the main components of a city and explain their interdependence in the context of managing a city as a dynamic system.
- Understand and interpret the concepts of a smart city and a resilient city in the context of sustainable urban management, based on standards presented by the International Organization for Standardization.
- Understand and explain the impact of sustainability concepts on the transformation of city management and the urban economics paradigm.
- Analyze facts to identify the maturity level of a city and recommend specific courses of action based on the obtained results.

4th semester (summer semester)

Traffic Safety Systems - 6 ECTS
(course coordinators: Ljudevit Krpan, Ivan Cvitković)

- Analyze the current state of traffic safety in urban transportation systems.
- Analyze the causes of traffic accidents.
- Propose measures to reduce traffic accidents, including the ability to assess and select the optimal measure.
- Reevaluate individual traffic solutions to enhance traffic safety.
- Coordinate all participants in the traffic process to reduce traffic accidents.
- Respond promptly and prepare professional reports aimed at reducing traffic accidents.
- Classify the impact of specific traffic solutions on human safety and the environment.
- Recommend appropriate measures to reduce traffic accidents.

Transport Geography and Flows of Goods and Passengers - 6 ECTS
(course coordinators: Miroslav Drljača, Ante Klečina)

- Identify the fundamental patterns in the formation and significance of goods and passenger flows.
- Differentiate types and characteristics of goods and passenger flows based on transportation modes, travel purposes, and other criteria.
- Describe and interpret geospatial, socio-economic, and logistical factors influencing the formation, expansion, and consolidation of goods and passenger flows.
- Explain and justify the needs and requirements of goods and passengers as transport objects.
- Define and distinguish the specific features of public urban passenger transport systems.
- Analyze and compare the intensity, structure, and dynamics of goods and passenger flows using concrete statistical data.
- Differentiate ancillary traffic flows within passenger transport flows (goods flows, information flows, stationary traffic, etc.).
- Argue trends and determinants in the development of goods and passenger transport.

Traffic Modeling - 6 ECTS
(course coordinators: Luka Novačko, Ante Klečina)

- Understand simulation modeling methods in traffic and recognize the significance and role of simulation techniques in transportation.
- Define, analyze, and design optimal elements of a traffic network using simulation tools.
- Formulate fundamental frameworks and methods for collecting traffic data and draw conclusions regarding traffic flow patterns as well as projections of future traffic demand.
- Compare and evaluate different development scenarios of a traffic system and justify the implementation of specific traffic solutions.
- Apply information systems for efficient traffic management.
- Develop simulation models, verify them, and understand the analysis of output data from simulation models.

Quality Management 2 - 6 ECTS
(course coordinators: Krešimir Buntak, Viktorija Adamić Ciglar)

- Understand and interpret the philosophy of quality and business excellence.
- Learn the fundamental principles of quality management systems with the ability to apply them in practical situations.

- Recognize and understand the three key characteristics of a well-managed organization: documentation, controllability, and competence.
- Identify and learn the system of standards related to quality management, including interpreting the structure of ISO 9001 and ISO 9004 standards.
- Sharpen analytical skills in measurement and analysis as a key requirement for continuous system improvement.
- Demonstrate the ability to write a case study according to given instructions, conduct literature research on the topic, use available literature, and demonstrate presentation and argumentation skills.
- Connect theory and practice by developing an understanding of quality management tools, their limitations, and applying this understanding to solve specific organizational problems.

Occupational Health and Safety Management - 6 ECTS
(course coordinator: Saša Petar)

- Understand the importance of a safety culture in logistics operations and identify key internal and external factors, as well as major trends in occupational safety and health in logistics.
- Recognize, evaluate, and analyze different types of safety procedures, assessing their advantages and limitations.
- Design, propose, develop, and implement strategies for employee health and safety, applying ISO 45001:2018 and related standards.
- Analyze, summarize, apply, and investigate new technologies necessary for organizational safety and health needs, including technical and communication elements.
- Understand the role of employee safety training, crisis team formation, and the importance of business security in logistics operations, recognizing shared responsibility among owners, managers, and employees.
- Integrate safety as a part of business policy and apply acquired knowledge, skills, and experience to define and enhance business security within logistics operations.

Managerial Accounting - 6 ECTS
(course coordinator: Ivana Martinčević)

- Understand the purpose, function, and objectives of managerial accounting.
- Comprehend the methodology for preparing the company's master plan and its role in evaluating business efficiency.
- Connect theory and practice by understanding the fundamental principles and methods of managerial accounting.
- Develop analytical skills necessary for managerial accounting in company management and business decision-making.
- Analyze and interpret budgeting as a foundation for managing revenues, costs, profits, and cash flows.
- Use properly interpreted managerial accounting information to propose solutions aimed at improving business performance and achieving profit.
- Apply modern cost management methods focused on long-term (strategic) planning and decision-making.

Digital Transformation and Logistics 4.0 - 6 ECTS
(course coordinators: Miljenko Mustapić, Branimir Buntak)

- Demonstrate the ability to collect and analyze gathered data.
- Select Industry 4.0 technological innovations to be applied in supporting processes.

- Interpret and describe the fundamental principles of digital transformation.
- Identify and analyze the impact of IT security risks within digital systems.
- Describe and differentiate the possibilities of applying Industry 4.0 technologies.
- Explain the impact of digital transformation on complex systems.