Name of subject	MODERN TRANSPORT LOGISTICS AND INFRASTRUCTURE (ECTS 4)
Subject/module code	**ZTLI2030**
Science taught semester (s).	1st semester
Responsible teacher	Ganiyev Inomjon Gulomovich – head of the department "Road engineering", PhD, professor
Education language	Uzbek
Connection to the curriculum	Elective
Training hours (this including independent education)	**Total hours – 120 hours** **Contact hours – 36 hours** Lecture training hours – 12 hours Practical training hours – 24 hours **Independent education – 84 hours**
Course work	No
ECTS	4
The purpose and tasks of subject / learning outcomes	**The purpose of teaching the subject is** To develop competence for analyzing modern transport-logistics systems, infrastructure and multimodal transport options using time, total cost, capacity, reliability, environmental and organizational criteria, and for defending evidence-based infrastructure-improvement decisions **The objectives of teaching the subject are** To teach students to analyze the interrelationships between different modes of transport and infrastructure components, freight flows, and service capacity; To assess the functional layouts of roads, airport terminals, logistics centers, and warehouses, and to identify bottlenecks that constrain operational processes; To develop skills in calculating and comparing multimodal transport chains, transportation costs, and infrastructure development alternatives; To verify and analyze data using digital maps and spreadsheets, assess emissions and risks, and substantiate sustainable transport and logistics solutions; To critically evaluate scientific literature, document the findings of individual and collaborative research, and independently present and defend personal contributions to research outcomes. **Learning outcomes:** 1. Classify transport modes, logistics chains and infrastructure elements by function, show their interrelationships and compare intermodal/multimodal options. 2. Calculate freight/transport flow, peak demand and capacity-utilization indicators from provided data and explain data limitations. 3. Analyze the functional layout of a logistics center, airport terminal or warehouse, identify bottlenecks and justify an improvement solution. 4. Identify scope/version of relevant infrastructure standards, distinguish national requirements from international recommendations and state limitations of the selected solution. 5. Calculate and compare at least two multimodal transport options by travel time, transshipment, total cost and service conditions and justify route selection. 6. Verify tabular and spatial transport data and create a map or analysis model using QGIS or available spreadsheet tools, documenting reproducible steps. 7. Calculate emissions from stated fuel/transport data and sourced emission factors, define system boundaries and compare reduction options.

	8. Evaluate infrastructure-development options by cost, service outcome and financing conditions and justify priorities under a stated budget. 9. Rank major logistics risks by likelihood and consequence and define continuity, safety and monitoring measures. 10. Formulate a research question, critically analyze verifiable sources/data, prepare a report separating results, assumptions and limitations, and defend individual contribution.
Course content (topics)	**I. Main Theoretical Part (Lecture Sessions).** Topics: 1. Introduction and regulatory framework for aerodrome pavements 2. Pavement foundations and construction-site preparation 3. Construction of asphalt aerodrome pavements 4. Construction of cement-concrete aerodrome pavements 5. Operation and diagnostics of aerodrome pavements 6. Maintenance, repair, strengthening and pavement management **II. Instructions and recommendations for organizing laboratory exercises** Laboratory work is not included in the curriculum **III. Practical training instructions and recommendations** The instructor's preparation for a practical session begins with the study of initial documents (such as the curriculum, topic schedule, etc.) and concludes with the development of a detailed lesson plan. The instructor must have a clear understanding of the objectives and tasks of the practical session, as well as the amount of work each student is expected to perform. Methodological guidelines serve as the primary instructional document for instructors in preparing and conducting practical sessions. The purpose of the practical session is to facilitate the comprehension of theoretical material, the acquisition of practical skills, the ability to consciously apply knowledge in academic and professional activities, and the development of critical thinking and confidence in forming personal viewpoints. *Recommended Practical Topics:* 1. Regional transport-logistics analysis 2. Freight-flow calculations 3. Design analysis of a logistics center 4. Field observation of road infrastructure 5. Assessment of aerodrome infrastructure 6. Multimodal transport-chain project 7. Work with digital logistics systems 8. Environmentally sustainable transport solutions 9. Assess efficiency of transport nodes 10. Warehouse logistics organization 11. Transport-cost optimization 12. Develop a strategy for modern logistics-infrastructure development **IV. Independent learning and independent work** Independent learning competency helps students to develop self-improvement skills and increase the efficiency of their professional activities. Students perform independent tasks on their mobile devices under the guidance of a teacher, either in traditional or electronic form. Recommended topics for independent work: 1. Theoretical analysis of transport modes and multimodal integration 2. Logistics infrastructure and regulatory framework 3. Green logistics and infrastructure-investment assessment 4. Regional logistics map and transport-flow analysis 5. Airport cargo terminal/logistics-centre efficiency

	6. Economic comparison of multimodal routes 7. Logistics safety and service-continuity research 8. Economic and environmental efficiency of multimodal transport 9. Digital logistics infrastructure development and investment priority
Exam form	Written
Teaching/learning and examination requirements	Complete mastery of theoretical and methodological concepts and practical knowledge of the discipline, the ability to correctly reflect the results of analysis, independently reason about the processes being studied and carry out tasks in the current, intermediate forms of control and independent work, pass written work on the final control. When drawing up final exam questions, deviations from the content of the discipline program are not allowed. The bank of final exam questions for each discipline is discussed at the meeting and approved by the head of the department. No later than 1 week before the start of the final control, tickets signed by the head of the department, enclosed in an envelope, are sealed by the Dean's office and opened 5 minutes before the start of the exam in the presence of students. Final exam duration is 80 minutes. Answers to final exam questions are recorded in copybooks with the seal of the Dean's office. After completion of the final work, the work is immediately encrypted by a representative of the Dean's office, and the copybooks are handed over to the commission for verification. From the moment of completion of the final exam, a period of 72 hours is allotted for checking and posting the results on the electronic platform. The teacher who taught the students in this discipline is not involved in the process of conducting the exam and checking the students' answers. Student(s) who are dissatisfied with the final exam results may submit a written or oral appeal within 24 hours of the publication of the final exam results. Complaints submitted after 24 hours from the publication of the final exam results will not be accepted.
Scope of assessment criteria and procedure	CURRENT CONTROL Purpose: Determining and assessing the student's level of knowledge, practical skills, and competencies on course topics. Instructions: The student's activity in daily classes is assessed through the student's mastery of course topics, as well as constructively interpreting and analyzing the educational material, developing module specific skills, acquiring practical skills (in terms of quality and the specified number) and competencies, solving problem situations aimed at applying professional practical skills, working in a team, preparing presentations, etc. Current control form: Activity in lessons; Preparing educational materials; Working with sources within the subject; Using educational technologies; Working in a team Preparing presentations; Working with projects. MIDTERM CONTROL Purpose: Assessing the student's knowledge and practical skills and level of mastery of lecture material after completing the relevant section of the course. Form and procedure of intermediate control: Midterm examination is held during the semester during the training sessions after the completion of the relevant module of the curriculum of the subject. Midterm examination is held once in written form within the framework of this subject. Midterm examination questions cover all topics of the subject. INDEPENDENT LEARNING

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<tr><td></td><td>Purpose: Independent learning is aimed at fully covering the content of this course, expanding the theoretical knowledge acquired, and establishing independent learning activities for students.
Form and procedure of independent education: independent work assignments are completed in the form of an educational project, presentation, case study, problem solving, information search, digest, colloquium, essay, article, abstract, etc. Completed assignments for independent study are placed in the electronic system and checked based on the anti-plagiarism program and evaluated by the subject teacher.
In this case, the uniqueness of the completed assignment should not be less than 60%, otherwise the assignment will not be accepted for assessment. The number of independent work assignments, depending on the nature of the subject, should not be less than 3 for one subject (module). Independent work assignments account for 60% of the points allocated for current and intermediate control.
FINAL CONTROL
Purpose: The final examination is held at the end of the semester to determine the level of mastery of the student's theoretical knowledge and practical skills in the relevant subject. The final examination is held at a specified time according to the examination schedule created by the Registrar's Office on the electronic platform.
Requirements: The student must have passed the current control, intermediate control and independent learning assignments by the deadline for the final control type in the relevant subject. A student who has not passed the current control, intermediate control and independent learning assignments, as well as who has received a score in the range of “0-29,9” for these assignments and control types, is not included in the final control type. Also, a student who has missed 25 percent or more of the classroom hours allocated to a subject without a reason is excluded from this subject and is not included in the final control type and is considered not to have mastered the relevant credits in this subject. A student who has not passed or was not included in the final control type and has received a score in the range of “0-29.9” for this type of control is considered to be an academic debtor.
Final control form: The final examination in this subject will be conducted in written form. If the final examination is conducted in written form, the requirements for assessment must also be reflected.</td></tr>
<tr><td>Criteria for assessing student knowledge</td><td>
<table>
<tr><th>5 grade</th><th>100 points</th><th></th><th>Assessment criteria</th></tr>
<tr><td>5</td><td>90-10</td><td>Excellent</td><td>When a student is considered to be able to make independent conclusions and decisions, think creatively, observe independently, apply the knowledge he has gained in practice, understand, know, express, and narrate the essence of the subject, and have an idea about the subject.</td></tr>
<tr><td>4</td><td>70-89,9</td><td>Good</td><td>When the student is considered to be able to observe independently, apply</td></tr>
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<tr><td>3</td><td>60-69,9</td><td>Satisfactory</td><td>When the student is found to be able to apply the knowledge he has gained in practice, understands, knows, can express, and narrate the essence of the subject, and has an idea about the subject.</td></tr>
<tr><td>2</td><td>0-59,9</td><td>Unsatisfactory</td><td>When it is determined that the student has not mastered the science program, does not understand the essence of the subject, and does not have an idea about the science.</td></tr>
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<tr><td>Course assessment criteria and procedure</td><td>
<table>
<tr><th>Assessment type</th><th>Total points allocated</th><th>Control (task) form</th><th>Distribution of points</th><th>Qualifying score</th></tr>
<tr><td rowspan="2">Current assessment</td><td rowspan="2">30 points</td><td>System tasks</td><td>20 points (divided by number of tasks)</td><td rowspan="2">18 points</td></tr>
<tr><td>Student activity (in seminars, practical, laboratory classes)</td><td>10 points</td></tr>
<tr><td rowspan="2">Midterm assessment</td><td rowspan="2">20 points</td><td>Supervision: writing work</td><td>10 points</td><td rowspan="2">12 points</td></tr>
<tr><td>System tasks</td><td>10 points (divided by number of tasks)</td></tr>
<tr><td>Final assessment</td><td>50 points</td><td>Written assignment (5 questions)</td><td>50 points (10 points per question)</td><td>30 points</td></tr>
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* Note: 60% of the points allocated for current and intermediate control are allocated to independent work assignments. Independent work assignments are evaluated as system assignments through the electronic platform.
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<tr><td>Recommended Literature</td><td>1. Ganiyev, I. Zamonaviy transport logistikasi va infratuzilmasi / I. Ganiyev. — Jizzakh: So‘g‘diyona NMU, 2024. 296 b.</td></tr>
</table>

	2. Christopher, M. Logistics and Supply Chain Management / M. Christopher. — 6th ed. — Pearson, 2022. 3. Rodrigue, J.-P. The Geography of Transport Systems / J.-P. Rodrigue. — 6th ed. — Routledge, 2024. 4. Chopra, S. Supply Chain Management: Strategy, Planning, and Operation / S. Chopra. — 8th ed. — Pearson, 2026. 5. ITF Transport Outlook 2023 / International Transport Forum. — OECD Publishing, 2023. 6. Connecting to Compete 2023: Logistics Performance Index / J.-F. Arvis et al. — World Bank, 2023.