Name of subject	RESEARCH WORK AND MASTER'S THESIS PREPARATION (ECTS 38)
Subject/module code	**ITIMDT1428**
Science taught semester (s).	1st, 2nd, 3rd and 4th semesters
Responsible teacher	Ganiyev Inomjon Gulomovich – head of the department "Road engineering", PhD, professor
Education language	Uzbek
Connection to the curriculum	Scientific activity
Training hours (this including independent education)	**Semester 1 — 180 h** **Semester 2 — 60 h** **Semester 3 — 240 h** **Semester 4 — 660 h**
ECTS	38
The purpose and tasks of subject / learning outcomes	**The purpose of teaching the subject is** To develop independent research competence in transport-infrastructure engineering: substantiation of a scientific problem, selection of methodology, analysis of theoretical and experimental results, formulation of scientific novelty and practical recommendations, and preparation and defense of a master's thesis. **The objectives of teaching the subject are** To provide a scientific justification for the relevance of the research topic, research problem, object and subject of investigation, research aim, objectives, and working hypothesis; To systematically search for, critically evaluate, and analyze national and international scientific literature, and to develop a comprehensive bibliographic database; To select appropriate theoretical, experimental, field, laboratory, and computational research methods, and to develop a comprehensive experimental research plan; To apply modern measuring instruments, sensors, diagnostic techniques, digital modeling tools, and statistical analysis software in scientific research; To process and interpret research findings, assess reliability and uncertainty, and compare theoretical predictions with experimental results; To prepare scientific articles, conference papers, research reports, presentations, and master's theses in accordance with the principles and requirements of academic integrity; To develop scientifically substantiated recommendations for the design, construction, maintenance, condition assessment, repair, reconstruction, and structural strengthening of transport infrastructure facilities. **Learning outcomes:** 1. Scientifically substantiate the research problem, relevance, object, subject, aim, tasks and hypothesis. 2. Search scientific databases/library resources, critically evaluate sources and prepare a systematic literature review. 3. Select and justify research design, methods, experimental program, sample and measurement instruments. 4. Organize field, laboratory and computational research in accordance with safety, ethics and metrological requirements. 5. Statistically process experimental/observational data, present results graphically and build mathematical or numerical models. 6. Compare theoretical and experimental results and assess reliability, error and uncertainty. 7. Formulate scientific novelty, practical significance, conclusions and recommendations based on evidence.

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<tr><td></td><td>8. Prepare articles, abstracts, reports, bibliographies and presentations according to international academic-writing principles.
9. Structure and format the introduction, main chapters, conclusion, references and appendices of the master's thesis.
10. Comply with academic integrity, citation, copyright, research ethics and responsible data-management requirements.
11. Defend results in scientific seminars and the final defense and conduct evidence-based scientific discussion.
12. Develop implementation proposals, assess technical-economic efficiency and prepare practice-oriented recommendations.</td></tr>
<tr><td>Course content</td><td>I. Main activity and expected outputs:
Semester 1 — Research structure and thesis requirements; literature search; research gap; consultations/seminars; research plan; relevance, object/subject/aim/tasks; preliminary methodology; draft introduction and Chapter 1; semester report.
Semester 2 — Develop theoretical basis and hypotheses; select research/experimental/computational method; measurement equipment; preliminary observations/diagnostics; uncertainty and ethics; methodology chapter; conference abstract; semester report.
Semester 3 — Build research database; statistical processing; graphics/models; regression and model calibration; compare theory/experiment; uncertainty/sensitivity; scientific interpretation; novelty and practical recommendations; efficiency/implementation proposal; article; results/discussion chapter; attestation.
Semester 4 — Finalize literature, field/lab/computational research, data/model reliability, results and novelty; technical-economic efficiency; conclusions/recommendations; publication/implementation documents; edit thesis and check academic integrity; pre-defense; final submission and defense preparation.</td></tr>
<tr><td>Scope of assessment criteria</td><td>This is an individual scientific-activity module rather than a taught course. Credit is awarded through completion of the approved individual research plan, semester reports/attestations, research outputs and successful thesis preparation/defense milestones.
<table>
<tr><th>Assessment evidence</th><th>Basis of judgement</th></tr>
<tr><td>Semester 1 (6 ECTS)</td><td>Literature review, research concept, draft introduction/Chapter 1 and semester report.</td></tr>
<tr><td>Semester 2 (2 ECTS)</td><td>Methodology, experimental plan, preliminary data and semester report.</td></tr>
<tr><td>Semester 3 (8 ECTS)</td><td>Processed results, article/abstract, results chapter and attestation.</td></tr>
<tr><td>Semester 4 (22 ECTS)</td><td>Completed thesis, pre-defence and final defence.</td></tr>
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<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,</td></tr>
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				express, and narrate the essence of the subject, and have an idea about the subject.
	4	70-89,9	Good	When the student is considered to be able to observe independently, apply the knowledge he has gained in practice, understand, know, express, and narrate the essence of the subject, and has an idea about the subject
	3	60-69,9	Satisfactory	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.
	2	0-59,9	Unsatisfactory	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.
Recommended Literature	1. Ganiyev, I. G. Ilmiy-tadqiqot ishi va magistrlik dissertatsiyasini tayyorlash / I. G. Ganiyev. — JizPI, 2026. 2. Tang, H. Engineering Research: Design, Methods, and Publication / H. Tang. — Wiley, 2021. 3. Creswell, J. W. Research Design / J. W. Creswell, J. D. Creswell. — 6th ed. — SAGE, 2023. 4. Ajimotokan, H. A. Research Techniques for Engineers / H. A. Ajimotokan. — Springer, 2023. 5. The Craft of Research / W. C. Booth et al. — 5th ed. — University of Chicago Press, 2024. 6. Antony, J. Design of Experiments for Engineers and Scientists / J. Antony. — 3rd ed. — Elsevier, 2023.			