

DOCTORAL STUDIES SUBJECT SANDAS

Title of the subject	Field of study (branch) code	Faculty	Department
Engineering petrology	Physical sciences (geology) 05P	Faculty of Chemistry and Geosciences	Hydrogeology and engineering geology
Studiju būdas	Number of credits ECTS	Method of study	credits
lectures		consultations	
individual	11	seminars	

Annotation of the subject
<p>The aim of the course is to deepen knowledge by getting to know the latest scientific achievements in the study of soil composition, physical condition and mechanical behavior. Understand the commonalities and differences in the characteristics of soil and rock genetic types</p> <p>Course content:</p> <p>1. Introductory concepts</p> <p>The place of engineering petrology among the disciplines of engineering geology. The interface of engineering petrology with other disciplines. Parameters of physical and mechanical properties of soils and rocks, their indexing and dimensions.</p> <p>2. Composition and classification of soils</p> <p>General engineering geological classifications of soils. General engineering geological characteristics of loose and cohesive soils - differences, commonalities... Fine and coarse soils as dispersion systems. Structural interfaces in dispersed soils.</p> <p>Collection and conservation of engineering geological samples and specimens. Documentation of samples. Engineering geological description of the soil. Evaluation of the material composition of the soil. Classifications of fine and coarse soils according to granular composition. Granulometric analysis. Graphical methods of representing granular composition.</p> <p>3. Physical properties of soils</p> <p>Parameters of soil natural density, dry soil density, water-saturated density, density of solid particles, laboratory methods of their assessment. Calculated values of specific gravity in foundation and slope calculations. Extreme estimates of soil specific gravity and density.</p> <p>Soil moisture parameters - weight and volume moisture. Natural determination of humidity in the laboratory and in the field. The degree of saturation of water and the use of this parameter.</p> <p>Porosity parameters - indicators, evaluation methods. Wet within the limits of yield and plasticity. The stage of plasticity, its use. Classification of primers according to consistency, flowability and consistency indicators. Structurally sensitive.</p> <p>4. Mechanical properties of soils</p> <p>Loads, stresses, deformations. Their connection. Notation of stresses, principal and tangential stresses. Total effective and neutral stresses. Types of deformations. Compression deformations, Hooke's law. Transverse deformations, Poisson's number. Deformation properties of coarse and fine soils. Lateral pressure coefficient, Poisson's number, transverse expansion coefficient. Compression tests, compression curves. Compression factor, compressive deformation modulus, deformation modulus. Physical meaning of compression tests, data processing. Finding the modulus of elasticity from the decompression curve. Structural strength (effective load) in compression tests.</p> <p>Consolidation, consolidation degree, consolidation parameters. Strength and strength parameters of coarse and fine soils. Shear deformations, shear modulus. Coulomb-Navje</p>

<p>strength theory, Coulomb equation, graph of this equation. Cutting tests, cutting schemes, standard cutting scheme. Total adhesion, coefficient of internal friction, shear coefficient, effect of pore pressure. Least-squares processing of shear data.</p> <p>Rankine-Moore theory of strength. Soil tests in stabilometers, data processing using the Moro diagram. Stabilometers of types A and B, total, effective and neutral stresses in stabilometric tests. Natural slope angle. Compressive strength.</p> <p>Tensile strength. Fragility factor, strength factor. Softening factor, Poisson's number, deformation and Jung's moduli of hard and semi-hard rocks. Finding the coefficient of general adhesion and internal friction from values of compressive and tensile strength parameters.</p>
Main literature
M. Carter, S P. Bentley. Soil properties and their correlations. John Wiley and sons, Ltd. 2016
R. E. Hunt. Geotechnical engineering investigation handbook. Taylor and Francis. 2005.
R.L Handy, M. G. Spangler. Geotechnical engineering. Soil and foundations principles and practice.
V. T. Trofimov and other. Gruntovedeniye. Moskva. Nauka. 2005 (in Russian)

Name and Surname	Science degree	Main publications (last 5 years)
Doc. dr. Saulius Gadeikis	doctor	<ol style="list-style-type: none"> Mario De Luca; Daiva Žilionienė; Saulius Gadeikis; Gianluca Dell'Acqua. Traffic pollution assessment using artificial neural network and multivariate analysis. The Baltic journal of road and bridge engineering, Vol. 12, no. 1 S1 - Straipsnis DB Clarivate Analytics Web of Science Vilniaus Gedimino technikos universitetas. 2017 Ieva Lekstutytė; Saulius Gadeikis; Gintaras Žaržojus; Šarūnas Skuodis. Medininkų ledynmečio periodo moreninių gruntų mechaninės savybės. Geologija. Geografija, t. 4, Nr. 2 S4 - Straipsnis kitose duomenų bazėse Vilniaus Gedimino technikos universitetas. 2018 Ieva Lekstutytė; Saulius Gadeikis; Gintaras Žaržojus; Šarūnas Skuodis. Some mechanical properties of Medininkai glacial period overconsolidated moraine clay. 26th European young geotechnical engineers conference, 11th-14th September, 2018 Reinschkogel, Austria : proceedings P1d - Straipsnis recenzuojamoje užsienio tarptautinės konferencijos medžiagoje. Vilniaus Gedimino technikos universitetas. 2018 Ieva Lekstutytė; Saulius Gadeikis; Gintaras Žaržojus; Šarūnas Skuodis. Engineering geological and geotechnical properties of till soil of the Middle Pleistocene glacial period. Estonian journal of earth sciences, vol. 68, iss. 2S1 - Straipsnis DB Clarivate Analytics Web

		<p>of Science Vilniaus Gedimino technikos universitetas 2019</p> <p>5. Saulius Gadeikis; Donatas Urbaitis; Domas Gribulis; Sonata Gadeikytė; Gintaras Žaržojus. Deformations of foundations of windplant installation crane sites and their reasons The 13th international conference “Modern building materials, structures and techniques”, 16–17 May, 2019, Vilnius, Lithuania P1e - Straipsnis recenzuojamoje Lietuvos tarptautinės konferencijos medžiagoje Vilniaus universitetas 2019</p> <p>6. Domas Gribulis; Gintaras Žaržojus; Saulius Gadeikis; Sonata Gadeikytė; Donatas Urbaitis. Research of undrained shear strength of till fine soils (moraine) The 13th international conference “Modern building materials, structures and techniques”, 16–17 May, 2019, Vilnius, Lithuania P1e - Straipsnis recenzuojamoje Lietuvos tarptautinės konferencijos medžiagoje Vilniaus universitetas 2019</p> <p>7. Saulius Gadeikis; Domas Gribulis; Kastytis Juozas Dundulis; Saulius Gadeikis; Sonata Gadeikytė Undrained shear strength of glacial till soils and its determining factors. Baltica, vol. 34, no. 2 S1 - Straipsnis DB Clarivate Analytics Web of Science Vilniaus universitetas 2021</p>
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Approved by the doctoral committee of Geology (N 005) on 1st of December 2022 (No. (7.17 E) 15600-KT-467).

Committee Chairman prof. dr. Sigitas Radzevičius