

LIST OF DISSERTATIONS TOPICS FOR DOCTORAL STUDIES COURSES IN 2019

NATURAL SCIENCES

Scientific areas	Topics of doctoral dissertations	Supervisors
MATHEMATICS – N 001	1. Algebraic number theory	Prof. Artūras Dubickas Prof. Paulius Drungilas
	2. Analytic number theory	Prof. Ramūnas Garunkštis Prof. Antanas Laurinčikas Dr. Giedrius Alkauskas
	3. Theory of random processes	Prof. Rimas Norvaiša Prof. Donatas Surgailis Prof. Remigijus Leipus Prof. Alfredas Račkauskas
	4. Differential equations and numerical methods	Prof. Feliksas Ivanauskas Prof. Artūras Štikonas Prof. Algirdas Ambrazevičius Prof. Olga Štikonienė Prof. Pranas Katauskis
	5. Risk Theory	Prof. Remigijus Leipus Prof. Jonas Šiaulys Doc. Martynas Manstavičius
	6. Mathematics education	Prof. Rimas Norvaiša
	7. Geometric group theory	Dr. Daniele Otera
	8. Combinatorics and graph theory	Prof. Mindaugas Bloznelis Prof. Eugenijus Manstavičius Doc. Vytas Zacharovas
	9. Mathematical statistics	Prof. Viliandas Bagdonavičius Prof. Vydas Čekanavičius Prof. Vytautas Kazakevičius Prof. Marijus Radavičius Doc. Rūta Levulienė

		Doc. Viktor Skorniakov
	10. Mathematical models in hydrodynamics	Prof. Konstantinas Pileckas
	11. Limit theorems	Prof. Kęstutis Kubilius
	12. Probability theory	Prof. Mindaugas Bloznelis Prof. Eugenijus Manstavičius Prof. Vygirdas Mackevičius Prof. Saulius Norvidas Prof. Vyantas Paulauskas Prof. Jonas Šiaulys Doc. Marijus Vaičiulis
PHYSICS – N 002	1. Distribution of carbon, nitrogen and oxygen in the Milky Way galaxy	Dr. Šarūnas Mikolaitis
	2. Protein with hydrogen bonding network environmental effects on processes in organic molecules by foaming active centers	Doc. Mindaugas Mačernis
	3. Fiber based SERS spectroscopy of biological fields	Prof. Valdas Šablinskas
	4. Applications of extreme light sources in imaging and spectroscopy	Dr. Mikas Vengris
	5. Femtosecond filamentation phenomena in transparent dielectrics at high pulse repetition rates	Prof. Audrius Dubietis
	6. Dynamical properties investigation of ferroelectric ceramics	Prof. Jūras Banys
	7. Broadband investigation of the electrical properties of solid electrolytes at very high temperatures	Doc. Algimantas Kežionis
	8. Relaxation theory of quantum systems with feedback: development of time dependent variational principle	Prof. Darius Abramavičius
	9. Abundances of mixing-sensitive chemical elements in red giants	Habil. dr. Gražina Tautvaišienė
	10. Spectral characteristics of molecular aggregates in optical fields of various intensities: from quantum optics to multi-excitonic effects	Prof. Darius Abramavičius
	11. Development and investigation of novel components for optical and terahertz range measurement systems	Prof. Vincas Tamošiūnas
	12. Nonlinear interaction of air and femtosecond laser pulses	Dr. Virgilijus Vaičaitis
	13. Planar semiconductor-based terahertz radiation sources	Prof. Alvydas Lisauskas
	14. Renormalising the Grimus-Neufeld model	Doc. Thomas Gajdosik
	15. Investigation of structural phase transitions and dynamical properties in hybrid perovskites by means of the dielectric spectroscopy	Prof. Robertas Grigalaitis
	16. Abundances of chemical elements in magnetically active stars	Habil. dr. Gražina Tautvaišienė
CHEMISTRY – N 003	1. Determination of organic pollutants in waters by liquid chromatography-mass spectrometry	Prof. Audrius Padarauskas

	2. Application of nanostructures in immunosensor design	Prof. Almira Ramanavičienė
	3. Development of sensing layers based on electrochemically and chemically deposited conjugated polymers	Prof. Arūnas Ramanavičius
	4. Prussian blue based optical and electrochemical sensors	Doc. Aušra Valiūnienė
	5. Modification and application of screen-printed electrodes	Prof. Henikas Cesiulis
	6. Formation and ellipsometric investigation of conducting polymer based layers	Doc. Ieva Plikusienė
	7. Molecularly imprinted polymers for sensor design	Doc. Deivis Plaušinitis
	8. New mixed-metal garnets $M(+2)_3M(+5)_{1.5}M(+3)_{3.5}O_{12}$ ($M(+2)$ – Mg, Ca, Sr or Ba; $M(+5)$ – V, Nb or Ta; $M(+3)$ – Al, Ga or In)	Prof. Aldona Beganskienė
	9. New approach for the fabrication of calcium hydroxyapatite coatings on titanium substrate	Prof. Aivaras Kareiva
	10. Investigation of phase transformations in the synthesis of calcium phosphate granules	Dr. Inga Grigoravičiūtė-Puronienė
	11. Synthesis of Hsp90 inhibitors based on 4,6-disubstituted benzene-1,3-diols	Doc. Algirdas Brukštus
	12. On-glass synthesis of biocompatible hydrogels for medicinal applications	Prof. Edvinas Orentas
	13. Synthesis of new TADF emitters	Prof. Edvinas Orentas
	14. Fluorescent brush polymers	Prof. Ričardas Makuška
	15. Synthesis and characterization of lanthanoid substituted ceria ceramics	Doc. Artūras Žalga
	16. Molecular Modeling of Li- and Na-ion electrochemical energy storage systems	Doc. Linas Vilčiauskas
	17. Search, characterization and applications of novel materials for aqueous Na-ion energy storage systems	Doc. Linas Vilčiauskas
BIOCHEMISTRY – N 004	1. Novel prognostic factors for acute myeloid leukaemia in adults	Dr. Veronika Borutinskaitė
	2. Interaction between misfolded proteins and phospholipid membranes	Dr. Rima Budvytytė
	3. Impact of extracellular environment on stem cell properties	Dr. Virginija Bukelskienė
	4. Role of epigenetic factors in female reproductive infertility	Prof. Rūta Navakauskienė
	5. Application of Biocatalysis Methods for Regioselective Synthesis	Dr. Jonita Stankevičiūtė
	6. Modified nucleosides for enzymatic synthesis of nucleic acids	Dr. Daiva Tauraitė
	7. Selection and investigation of aldose oxidoreductases	Dr. Vida Česaitė
	8. Organs on a chip: tethered bilayer membranes derived from mammalian cells	Dr. Gintaras Valinčius

	9. Targeting the microbiota-gut-brain axis in Alzheimer's disease	Dr. Aurelijus Burokas
	10. Search for correlations between ligand binding structure and thermodynamics for improved drug design	Dr. Daumantas Matulis
	11. Study of ligands binding to parasitic protozoan Hsp90	Dr. Daumantas Matulis Dr. Egidijus Kazlauskas
	12. Structure and mechanism of novel bacterial antiviral systems	Dr. Giedrius Sasnauskas
	13. Structural and functional studies of prokaryotic antiviral defense systems	Dr. Giedrė Tamulaitienė
	14. Studies of bacterial antiviral defense systems	Dr. Gintautas Tamulaitis
	15. Structural and functional studies of prokaryotic Argonaute proteins	Dr. Mindaugas Zaremba
	16. New double-stranded RNA viral systems in yeast	Prof. Saulius Serva
	17. Functions of PARP family proteins during the response of human cancer cells after the treatment of fractionated dose ionizing radiation	Prof. Kęstutis Sužiedėlis
	18. Glycobiology of synaptic pruning in developing brain	Dr. Urtė Neniškytė
GEOLOGY – N 005	1. Research of the fine till composition and their engineering features	Doc. Saulius Gadeikis
	2. Research on the distribution of hazardous substances in groundwater	Doc. Kęstutis Jokšas
	3. The Lower-Middle Devonian aquifer system groundwater flow 3D modeling using coupled environmental isotopes and hydrogeochemistry data	Prof. Robert Mokrik
	4. Integrated stratigraphy and palaeogeography of Wenlock (Silurian) in Lithuania	Prof. Sigitas Radzevičius
	5. Micro- and macroevolutionary trends in the Silurian Ostracoda in relation to paleoceanographic perturbations in the Silurian Baltic Basin	Doc. Andrej Spiridonov
	6. The development and application of dynamical systems approaches for the discovery and description of macroevolution, paleoecology and stratigraphy	Doc. Andrej Spiridonov
PHYSICAL GEOGRAPHY – N 006	1. The system of functional cartographic styles	Prof. Giedrė Beconytė
	2. Investigation of sediment transport and hydrodynamic processes based on coastal sediments magnetic properties (Southeastern Baltic Sea)	Doc. Donatas Pupienis
	3. Trajectories of Lithuanian landscape change in the 19th-21st centuries	Doc. Darijus Veteikis
INFORMATICS – N 009	1. Computational modeling of physical, chemical, biological and social systems	Doc. Algirdas Ambrazevičius Prof. Romas Baronas Doc. Pranas Katauskis Doc. Rimvydas Krasauskas Doc. Saulius Masteika Prof. Tadas Meškauskas Prof. Darius Plikynas Prof. Rimantas Vaicekauskas Doc. Severinas Zubė
	2. Network models and algorithms	Prof. Mindaugas Bloznelis Prof. Eugenijus Manstavičius

	3. Big data mining	Doc. Igoris Belovas Prof. Audronė Jakaitienė Dr. Virginijus Marcinkevičius Dr. Viktor Medvedev Prof. Olegas Vasilecas Prof. Julius Žilinskas
	4. Visualization of multidimensional data	Prof. Gintautas Dzemyda Prof. Olga Kurasova
	5. Optimization algorithms and their applications	Doc. Algirdas Lančinskas Dr. Remigijus Paulavičius Prof. Julius Žilinskas
	6. Artificial intelligence and machine learning	Prof. Gintautas Dzemyda Prof. Olga Kurasova Dr. Virginijus Marcinkevičius Dr. Viktor Medvedev Prof. Darius Plikynas Doc. Aistis Raudys
	7. Computational complexity: the lower bounds problem	Prof. Stasys Jukna
	8. Operations research	Doc. Igoris Belovas Doc. Saulius Minkevičius Prof. Rimantas Rudzkis Prof. Leonidas Sakalauskas
	9. Artificial neural networks, deep learning	Prof. Gintautas Dzemyda Prof. Olga Kurasova Dr. Virginijus Marcinkevičius Dr. Viktor Medvedev
	10. Formal modelling, verification, and quantitative assessment of computer - based systems	Dr. Haroldas Giedra Prof. Linas Laibinis Doc. Karolis Petrauskas
	11. Information systems and decision making	Prof. Dalė Dzemydienė Prof. Saulius Gudas
BIOLOGY – N 010	1. Investigation of genotype-phenotype spaces of lipolytic enzymes produced by Geobacillus bacteria via protein engineering strategies	Doc. Eglė Lastauskienė
	2. Antimicrobial Mechanism of Silver Nanoparticles Synthesized by Geobacillus Genus Bacteria for the Biocontrol of the Pathogenic Human Skin Microbiota	Doc. Eglė Lastauskienė
	3. The role of maternal metabolic status for the neurodevelopment of the offspring	Dr. Urtė Neniškytė
	4. Analysis of genotoxicity of nanoparticles in model systems in vitro and in vivo	Prof. Juozas Rimantas Lazutka

	5. Development of model for reproductive tissue transplantation and in vitro maturation	Dr. Živilė Gudlevičienė
	6. Induced rabbit Meibomian gland dysfunction mimicking dry eye syndrome in experimental animals model	Dr. Giedrius Kalesnykas
	7. Impacts of Low-Dose Radiation in Lithuanian population after Chernobyl accident	Dr. Giedrė Smailytė
	8. Developing of virtual genetic biobank of cancer for novel diagnostic and therapeutic targets identification (Abbreviation – biobank of cancer genes	Prof. Sonata Jarmalaitė
	9. Search of biomarkers reflecting the immune response of ovarian cancer cell to chemoimmunotherapy	Dr. Vita Pašukonienė
ECOLOGY AND ENVIRONMENTAL SCIENCES – N 012	1. Influence of climate change on immobilization of pollutants in sediments of surface water bodies	Doc. Gytautas Ignatavičius
	2. Research on the influence of natural and human factors on car collisions with large animals in Lithuania	Doc. Gytautas Ignatavičius
	3. Models of socioeconomic acceptance of ecosystem key stone species	Prof. Alius Ulevičius
	4. Transfer of materials and energy between different ecosystems by small mammals using C and N isotope method	Prof. Alius Ulevičius
BIOPHYSICS – N 011	1. Investigation of the effect of modulators of Ca ²⁺ channels on membrane transport systems of characean <i>Nitellopsis obtusa</i>	Doc. Vilma Kisnierienė
	2. Bio-imaging of 3D cellular organoids with theranostic nanoplatform	Prof. Ričardas Rotomskis
	3. Toxicity and interaction of luminescent nanomaterials with biological objects	Prof. Ričardas Rotomskis
	4. Psychophysiological investigation of the effect of hormonal contraceptives on healthy women nervous system functions	Prof. Osvaldas Rukšėnas
	5. Psychophysiological investigation of the effect of hormonal contraceptives on healthy women social and emotional functions	Prof. Osvaldas Rukšėnas
	6. Electrochemical impedance study of phospholipid membrane damage by antimicrobial peptides	Dr. Gintaras Valinčius
ZOOLOGY – N 014	1. Saprophytic beetle diversity in dead wood	Doc. Virginija Podėnienė