PhD STUDIES COURSE UNIT DESCRIPTION

Name of subject	Field of science, code	Faculty / Center	Department
Biochemical methods in analytical chemistry	Chemistry N 003	Chemijos ir geomokslų fakultetas, Chemijos institutas	Physical chemistry
Student's workload	**Credits**	**Student's workload**	**Credits**
Lectures		Consultations	
Independent study	10	Seminars	

Course annotation
Overview of analytical methods. Spectroscopic methods in bioanalytical chemistry photoluminescence, turbidometry, refractometry, Raman spectroscopy, etc. Backgrounds in electroanalytical chemistry, potentiometric analysis, conductometric analysis, amperometric analysis, electrophoresis. Immunoanalytical chemistry. Interaction between antigen and analyte. Interactions that are important in formation of antigen-antibody complex and influences the stability of this complex. Kinetics in biochemical reactions Types of biosensors. Biologically active materials that are used in biosensor deign. Methods applied for the immobilization of biomaterials.
Reading list
1. Peter G. Edelman and Joseph Wang, Biosensors & Chemical Sensors. 1992. 2. D.M. Fraster. Biosensors in the body. 1997. 3. Atkins P., Paula J.Physical Chemistry for the Life Sceinces Oxford University Press, 2006. 4. L.Gortin (Ed.), Biosensors and modern biospecific analytical techniques, in: Comprehensive Analytical Chemitry, vol. 44. Elsevier, 2007, 635 p.

The names of consulting teachers	**Science degree**	**Main scientific works published in a scientific field in last 5 year period**
Arūnas Ramanavičius	Habil.dr.	S. Ramanavicius, A. Ramanavicius. Conducting Polymers in the Design of Biosensors and Biofuel Cells. *Polymers* 2021, 13, 49. S. Ramanavicius, A. Ramanavicius. Charge transfer and biocompatibility aspects in conducting polymers based enzymatic biosensors and biofuel cells. *Nanomaterials* 2021, 11, 371. J. Dronina, U. Samukaite Bubniene, A. Ramanavicius. The application of DNA polymerases and Cas9 as representative of DNA-modifying enzymes group in DNA sensor design (Review). *Biosensors and Bioelectronics* 2021, 175, 112867. S. Ramanavicius, A. Jagminas, A. Ramanavicius, Advances in molecularly imprinted polymers based affinity sensors (Review). *Polymers* 2021, 13, 974. M. Drobysh, A. Ramanaviciene, R. Viter, A. Ramanavicius. Affinity sensors for the diagnosis of COVID-19. *Micromachines* 2021, 12, 390.

Certified during Doctoral Committee session on September 28th, 2021. Protocol No. 610000-KT-142.
Committee Chairman prof. habil. dr. Aivaras Kareiva