

STUDY PROGRAMME	CHEMICAL ANALYSIS, 653F18001
SUBJECT TITLE	Methods of Biochemical Analysis
NUMBER OF CREDITS	6
DURATION OF SUBJECT	Total: 160 hours (88 contact hours, 72 self-study hours)
TEACHING PERIOD	Autumn Semester 3 cr. Spring Semester 3 cr.
SUBJECT CONTENT	<p>Subject objective Provide students with the knowledge of modern methods used in biochemical analysis and develop skills to apply the gained knowledge in practice.</p> <p>Learning outcomes Be able to: analyse and systematise the subject specific information, publicly present it and take responsibility for the results; apply analysis methods of nucleic acids and protein in a dynamic practical activity and critically evaluate the findings; analyse and assimilate new genomics methods, select and apply the method corresponding to the objective of the analysis; assess findings of biochemical analysis methods, reliability and understand their meaning; discuss the importance of the quality of biochemical analysis results on the organisation and society; characterise nucleic acid exchange reactions carried out by enzymes and analyse the product of the reaction; evaluate the effect of chemical materials and physical parameters on the efficiency of enzymatic reactions; select and use reagents, solutions and equipment for biochemical analysis; analyse the importance of material, reagent, equipment and the method parameters on results of the biochemical analysis; prepare nucleic acid and protein samples for biochemical analysis; evaluate properties of DNA, RNA, protein and other biological materials and their importance for sample preparation and the analysis; evaluate the parameters of quantitative and qualitative methods, select analysis conditions to obtain reliable results; carry out qualitative and quantitative analysis to determine nucleic acid and protein; perform a nucleic acid and protein biochemical analysis using specific laboratory apparatus and methods; organise, analyse and describe analysis data using statistical methods and principles of good documentation practice; evaluate the application of biotechnology products and methods, their operation and importance for biotechnology; analyse the quality parameters of molecular biology reagents and methods.</p> <p>Content (topics)</p> <ol style="list-style-type: none"> 1. Work in a laboratory, Preparation and storage of vessels and solutions. 2. Statistical methods for experiment planning and result analysis. 3. Working with automatic pipettes. 4. Buffer solutions and their preparation. 5. Spectroscopic analysis, fluorescence in biochemical analysis. 6. Protein, enzymes, methods to determine their concentration. Methods of protein analysis. 7. Preparation of polyacrylamide gels for protein analysis. 8. Protein electrophoresis. 9. Defection of protein in gels and having transferred onto the membrane. 10. Nucleic acids, purification methods, determination of RNA and DNA concentration.

	<ol style="list-style-type: none"> 11. Peculiarities of working with RNA. 12. Nucleic acid electrophoresis and detection in gels 13. Manipulation of DNA: restriction endonucleases, ligation 14. Methods of immunochemical analysis 15. Polymerase chain reaction 16. Quantitative PCR and other nucleic acid amplification methods 17. The use of radioisotope in analysis 18. Methods of nucleic acids labelling 19. DNA sequencing. Classical and modern methods.
ASSESSMENT	Cumulative assessment (intermediate settlements, laboratory work, project)
SUBJECT COORDINATOR	<p>Julius Gagilas Vilniaus kolegija/University of Applied Sciences, Faculty of Agrotechnologies, Chemistry Department 2A Beržų str., Buivydiškės, Vilnius district, LT-14160, Lithuania Tel. +370 5 2 19 16 59 E-mail: chemija@atf.viko.lt</p>