COURSE DESCRIPTION (Group C)

Course code	Course group	Volume in ECTS credits	Course valid from	Course valid to	Reg. No.
BBK 3104	C	5			

Course type (compulsory or optional)	**Compulsory**
Course level (study cycle)	**Bachelor**
Semester the course is delivered	**5, Autumn**
Study form (face-to-face or distant)	**Face-to-face**

Course title in Lithuanian

BIOORGANINĖ IR POLIMERŲ CHEMIJA

Course title in English

BIOORGANIC AND POLYMER CHEMISTRY

Short course annotation in Lithuanian (up to 500 characters)

Dalyko dėstymo metu supažindinama su polimerų chemijos raida, pagrindiniais polimerų chemijos terminais, polimerų klasifikacija ir nomenklatūra. Pateikiami pagrindiniai polimerų sintezės metodai, makromolekulių reakcijos, mechaninės savybės. Supažindinama su polimerų struktūros ypatumais. Taip pat, bus pateikti pagrindiniai gamtiniai polimerai, jų klasifikacija, struktūra, izomerija, cheminės savybės bei jų modifikavimo būdai.

Short course annotation in English (up to 500 characters)

The course provides fundamental knowledge of polymer evolution, main expressions of polymer chemistry, classification of polymers, nomenclature. The main methods of polymer synthesis and macromolecular reactions, mechanical properties will be presented. The course presents peculiarities of polymer structure. The main natural polymers, their classification, structure, isomerism, chemical properties and modification will be also presented.

Prerequisites for entering the course

Organic and Physical Chemistry

Course aim

Introduction to the basics of bioorganic and polymer chemistry

Links between study programme outcomes, course outcomes and criteria of learning achievement evaluation

Study programme outcomes	Course outcomes	Criteria of learning achievement evaluation
Knowledge of Chemistry: terminology, conventions and units; The groups of organic compounds of organic compounds, synthesis and properties of organic compounds, reaction mechanisms, stereochemistry, structure and properties of natural compounds; Skills of safe handling of chemicals and instruments, skills of standard laboratory procedures.	1.To know the evolution stages of polymer chemistry, the main expressions, classification and nomenclature of polymers. To name polymers	Students will know the evolution stages of polymer chemistry, the main expressions, classification and nomenclature of polymers. To name polymers
	2.Define macromolecules structure, explain macromolecules coupling rules. Explain macromolecules structure dependence of chemical and physical properties	Students will define macromolecules structure, explain macromolecules coupling rules, explain macromolecules structure dependence of chemical and physical properties
	3.Evaluate the factors influence on chain flexibility, explain the differences of conformation and configuration. Evaluate conditions of reactions influence to these parameters	Students will evaluate the factors influence on chain flexibility, explain the differences of conformation and configuration. Will evaluate conditions of reactions influence to these parameters

	4.To find out polymer state peculiarities and structure differences depending on polymer state	Students find out polymer state peculiarities and structure differences depending on polymer state
	5.To find out mechanical properties dependence on polymer structure, fillers. Comprehend dependence of mechanical, optical and electric properties on supplements	Students find out mechanical properties dependence on polymer structure, fillers. Will comprehend dependence of mechanical, optical and electric properties on supplements
	6.Compare diluted, concentrated polymer solutions, polymer gels	Students will compare diluted, concentrated polymer solutions, polymer gels
	7.To calculate and compare averages of polymer mass, polydispersity index.	Will calculate and compare averages of polymer mass, polydispersity index.
	8.Comprehend the main methods of polymer synthesis and macromolecular reactions. Write reactions	Students will comprehend the main methods of polymer synthesis and macromolecular reactions. Will write reactions
	9.Be able classify and to name natural polymers.	Students be able to classify and name natural polymers
	10.Be able to identify isomers configuration of natural polymers	Students be able to identify isomers configuration of natural polymers
	11.To know chemical properties, modification and application of natural polymers	Students will know chemical properties, modification and application of natural polymers
	12.To know synthesis and application of cyclic natural polymers	Students will know synthesis and application of cyclic natural polymers

Link between course outcomes and content

Course outcomes	**Content (topics)**
1.To know the evolution stages of polymer chemistry, the main expressions, classification and nomenclature of polymers. To name polymers	1. Evolution of polymer chemistry, the main expressions. 2. Classification and nomenclature of polymers.
2.Define macromolecules structure, explain macromolecules coupling rules. Explain macromolecules structure dependence of chemical and physical properties	3. Structure of macromolecules.
3.Evaluate the factors influence on chain flexibility, explain the differences of conformation and configuration. Evaluate conditions of reactions influence to these parameters	4. Isomers. 5. Conformation and configuration of macromolecules.
4.To find out polymer state peculiarities and structure differences depending on polymer state	6. Polymer states and structure.
5.To find out mechanical properties dependence on polymer structure, fillers. Comprehend dependence of mechanical, optical and electric properties on supplements	7. Mechanical, optical and electric properties of polymers.
6.Compare diluted, concentrated polymer solutions, polymer gels	8. Polymer solutions.
7.To calculate and compare averages of polymer mass, polydispersity index.	9. Polymer molecular weight and its determination methods.
8.Comprehend the main methods of polymer synthesis and macromolecular reactions. Write reactions	10. Synthesis of polymers.

9.Be able to classify and to name natural polymers.	11. Polymer reactions.
10.Be able to identify isomers configuration of natural polymers	12. Classification and nomenclature of natural polymers.
11.To know chemical properties, modification and application of natural polymers	13. Isomerism of natural polymers.
12.To know synthesis and application of cyclic natural polymers	14. Chemical properties, modification and application of natural polymers. 15. Cyclic natural polymers.

Study (teaching and learning) methods

Teaching methods: explaining represented matter; exemplification; formulation and explaining of problematic exercises and practical tasks; consulting.

Learning methods: discussions; analysing of problematic exercises; taking counsel; literature analysis; learning of lectures and practise classes matters; performance of practical tasks; performance of laboratory works; independent students work: search and analysis of information concerning studying object.

Methods of learning achievement assessment

Interview in written form, performance of practical tasks and works.

Distribution of workload for students (contact and independent work hours)

Lectures	**37,5 hours**
Laboratory work	**30 hours**
Individual students work	**75,5 hours**
Knowledge test	**7 hours**
Total:	**150 hours**

Structure of cumulative score and value of its constituent parts

Mid-term exam - 20 %, laboratory work (report and test) - 15 %, test - 15 %, final exam - 50 %

Recommended reference materials

No.	Publication year	Authors of publication and title	Publishing house	Number of copies in		
				University library	*Self-study rooms*	*Other libraries*
Basic materials						
1.	2002	V. Laurinavičius *Organinė ir bioorganinė chemija*	Vilnius. Mokslo ir enciklopedijų leidykla	45	2	
2.	2008	J. Kadziauskas *Biochemijos pagrindai*	Vilnius : Vilniaus universiteto leidykla	64	1	
3.	1999	V.Mildažienė, J,Kadziauskas, R,Daugelavičius, V.Laurinavičius, Z.Naučienė, D.Bironaitė *Struktūrinė biochemija*	Kaunas : Vytauto Didžiojo universitetas	64	1	
4.	2001	A. Žemaitaitis *Polimerų fizika ir chemija*.	„Technologija“, Kaunas	1	1	

Course programme designed by

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