

FACULTY of Chemistry

SUBJECT CARD**Name of subject in Polish** Chemia Bioorganiczna**Name of subject in English** Bioorganic Chemistry**Main field of study (if applicable):** Advanced Nano and Biomaterials - MONABIPHOT**Specialization (if applicable):****Profile:** academic**Level and form of studies:** 2nd level**Kind of subject:** obligatory**Subject code** W03ANB-SM2004W**Group of courses** NO

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30				
Number of hours of total student workload (CNPS)	75				
Form of crediting (Examination)	x				
For group of courses mark (X) final course					
Number of ECTS points	3				
including number of ECTS points for practical classes (P)					
including number of ECTS points corresponding to classes that require direct participation of lecturers and other academics (BU)	1,3				

*delete as not necessary

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. knowledge of the basics of organic chemistry and biochemistry
2. knowledge of the basics of chromatographic and spectroscopic methods
3. possession of practical skills related to the application of laboratory techniques of organic chemistry from the range of courses provided in the curriculum of the first-degree program
4. knowledge of the English language

SUBJECT OBJECTIVES

- C1. To familiarize students with the issues of bioorganic chemistry.
- C2. To familiarize students with the issues of mimetics of biochemical processes.
- C3. To acquaint students with the issues of molecular receptors.
- C4. To familiarize students with the structure, properties and use of various groups of compounds used in bioorganic chemistry.
- C5. To acquaint students with the practical possibilities of using particular groups of compounds as enzyme mimetics and molecular receptors.
- C6. To acquaint students with the methods of obtaining macrocyclic receptors

C7. To acquaint students with scientific literature and literature examples

SUBJECT EDUCATIONAL EFFECTS

In terms of knowledge:

PEU_W01 - knows what is bioorganic chemistry and knows the scope of its application.

PEU_W02 - knows the properties of individual groups of compounds applicable in bioorganic chemistry

PEU_W03 - knows the application of discussed, individual groups of compounds in bioorganic chemistry

PEU_W04 - knows the basic methods of obtaining macromolecular compounds

PEU_W05 - knows the types of intermolecular interactions and which compounds participate in the formation of individual interactions

PEU_W06 - knows what supramolecular chemistry is, knows the different types and can give examples of the application of supramolecular complexes

PROGRAMME CONTENT

Lecture		Number of hours
Lec 1	Presentation of the general characteristics of the subject	2
Lec 2	Mimetics of peptides and proteins	2
Lec 3	Mimetics of DNA and RNA nucleic acids	2
Lec 4	Structure, properties and applications of cyclodextrins	2
Lec 5	Structure, properties and application of dendrimers	2
Lec 6	Structure, properties and applications of calixarenes	2
Lec 7	Structure, properties and applications of cyclophanes	2
Lec 8	Structure, properties and applications of crown ethers and cyclic polyamines	2
Lec 9	Enzyme mimetics - molecular printing of polymers	2
Lec 10	Micellar catalysis, liposomes, fatty acid mimetics	2
Lec 11	Structure, properties and applications of porphyrins	2
Lec 12	Carbohydrates and their derivatives	2
Lec 13	Receptors for compounds having diol groups	2
Lec 14	Application of allotropic carbon groupings in bioorganic chemistry	2
Lec 15	Structure, properties and applications of rotaxanes and catenanes	2

	Total hours	30
Classes		Number of hours
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	
Laboratory		Number of hours
Lab 1		
Lab 2		
Lab 3		
Lab 4		
Lab 5		
...		
	Total hours	
Project		Number of hours
Proj 1		
Proj 2		
Proj 3		
Proj 4		
...		
	Total hours	
Seminar		Number of hours
Semin 1		
Semin 2		
Semin 3		
...		
	Total hours	
TEACHING TOOLS USED		
N1. Informative and problem-oriented lecture using multimedia presentation		
N2. Consultation		
N3. Student's own work		

EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT

Evaluation (F – forming during semester), P – concluding (at semester end)	Learning outcomes code	Way of evaluating learning outcomes achievement
F1	PEU_W01 - PEU_W06	Examination in oral form - presentation
F2		
F3		
P		
PRIMARY AND SECONDARY LITERATURE		
<u>PRIMARY LITERATURE:</u>		
[1] Jerry L. Atwood, Comprehensive Supramolecular Chemistry, Elsevier LTD 2017		
[2] Marcel Van de Voorde, Nanoscience and Nanotechnology, De Gruyter 2018		
[3] Czasopisma naukowe		
Aktualne książki z zakresu chemii bioorganicznej, nanotechnologii i chemii supramolekularnej		
<u>SECONDARY LITERATURE:</u>		
Current books on bioorganic chemistry, nanotechnology and supramolecular chemistry		
SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)		
Piotr Mlynarz, piotr.mlynarz@pwr.wroc.pl		