UNIWERSYTET GDAŃSKI

Course title Biochemia / Biochemistry	**ECTS code** 7.2.0605

Name of unit administrating study
Faculty of Chemistry

Studies

Field of study	Type	Form	
Environmental Protection	Bachelor	Full-time studies	

Teaching staff
Prof. dr hab. Krzysztof Rolka

Forms of classes, the realization and number of hours	**ECTS credits** 4
A. Forms of classes, in accordance with the UG Rector's regulations lecture, laboratory classes	classes - 45 h tutorial classes – 15 h student's own work – 40 h Total: 100 h - 4 ECTS
B. The realization of activities in-class learning	
C. Number of hours 45 h (15 h lecture, 30 h laboratory classes)	

The academic cycle
Third year, winter semester

Type of course obligatory	**Language of instruction** Polish
Teaching methods Lecture with multimedia presentation Problem-solving tutorials Laboratory experiments	**Form and method of assessment and basic criteria for evaluation or examination requirements** **A. Final evaluation, in accordance with the UG study regulations** lecture – exam laboratory classes – course completion (with a grade) **B. Assessment methods** - **Written exam with open questions** **C. The basic criteria for evaluation** or exam requirements • positive grade received in written exam composed of 5-10 open questions covering issues listed in the course contents; answers to these questions will require solving tasks specified in educational outcomes; the grading scale would be adjusted to the range of all rated exams • to take the exam both the laboratory classes and *tutorials* must be passed; *Tutorials:* • passing two written colloquiums covering: (1) chemical structures and properties of amino acids, peptides and proteins (2) chemical structure and properties of monosaccharides, polysaccharides, lipids, cell membranes and nucleic acids; • each negative grade should be improved at repeat colloquium. Laboratory classes: • positive grade received in 3 preliminary testes, that check knowledge required to perform experiments during the classes; accomplishment of all planned experimental work (quality of laboratory work, ability to team work and mode of work would be graded); analysis of obtained results performed as written report; • to complete the laboratory course each negative grade must be improved.

Required courses and introductory requirements
Organic chemistry (bachelor level)
Fundamentals of organic chemistry, skills to work in a chemical laboratory, knowledge of basic laboratory glassware, learning the principles of work in a biochemical laboratory

Aims of education

• to acquaint students with all issues mentioned in the lecture contents;
• to introduce students to the basic endogenous organic compounds, their structure and functions;
• to acquaint students with basic metabolic pathways and relations between them;
• to teach students how to perform biochemical experiments using delivered instructions;
• to develop the ability to critically asses and interpret obtained experimental results and analysis of scientific sources;

A. Lecture: Energy-rich compounds, thermodynamics of biochemical reactions. Classification, structures and functions of enzymes. Mechanisms of enzyme catalysis. Carbohydrates, lipids and proteins – structures and functions. Biological membranes – structure and functions. Metabolic pathways: glycolysis, gluconeo-genesis, pyruvate decarboxylation, Krebs cycle, oxidative phosphorylation, glycogen metabolism, fatty ac-ids metabolism, amino acids metabolism, pentose phosphate pathway. Proteins G and signal transduction. Photosynthesis. DNA and RNA: replication, transcription, translation, PCR. Basics of genetic engineering.
B. Tutorial: Chemical structure, physicochemical properties and biological functions of peptides, proteins, nucleic acids, phospholipids, mono- and polysaccharides.
C. The lab: completion of five experiments with the following topics: determination of activity of serine proteinases and their inhibitors using chromogenic substrates, determination of kinetic parameters of select-ed chromogenic substrate, separation of proteins by size-exclusion chromatography, phospholipid analysis by thin layer chromatography, determination of polysaccharides susceptibility to hydrolysis in low pH

Bibliography of literature

A. Literature required to pass the course

J. M. Berg, J. L. Tymoczko, L. Stryer, „Biochemia", PWN, Warszawa 2009
Monographic works provided by assistants leading classes

B. Extracurricular readings

Various academic handbooks concerning biochemistry