

Course title: ENZYMOLOGY

ECTS credit allocation (and other scores): 3

Semester: summer

Level of study: ISCED-6 - first-cycle programmes (EQF-6) / ISCED-7 - second-cycle programmes (EQF-7)

Branch of science: Natural sciences

Language: English

Number of hours per semester: 45 h.

Course coordinator/ Department and e-mail: Małgorzata Dmitryjuk; Department of Biochemistry;
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Type of classes: classes and lectures

Substantive content

CLASSES: Determination of activity and properties of yeast invertase. Salting out and fractionation of enzyme protein with cold acetone. Determination of the degree of purification of the preparation using polyacrylamide gel electrophoresis. Determination of basic properties of the obtained enzyme preparations (optimum temperature and pH).

LECTURES: The concept of an enzyme. The active site of an enzyme. Bonds involved in the formation of an enzyme-substrate complex. The mechanism of enzymatic catalysis. Kinetics of enzymatic reactions. Methods of expressing enzymatic activity. Activators and inhibitors of enzymatic reactions. The rate of the enzymatic reaction and the regulation of enzymatic processes. Methods of enzyme purification. Enzyme taxonomy - the international enzyme code. Practical applications of enzymes.

LEARNING PURPOSE: Understanding and practical use of knowledge of enzymology to evaluate chemical processes occurring in living organisms and in technological processes.

On completion of the study programme the graduate will gain:

KNOWLEDGE: student describes the structure of enzymes and is able to relate it to their function, defines and describes biocatalysis in various biological systems

SKILLS: student uses basic techniques in enzymology, is able to perform quantitative and qualitative analyses, has the ability to operate research equipment in the laboratory

SOCIAL COMPETENCIES: student is aware of the updating of knowledge in the field of enzymological biochemistry

Basic literature: 1.) Bisswanger Hans, Practical Enzymology, WILEY-VCH, New Jersey, USA, 2021. 2.) Price Nicholas C. and Lewis Stevens, Fundamentals of Enzymology: The Cell and Molecular Biology of Catalytic Proteins, Oxford Univ Press, Oxford, UK, 1999.

Supplementary literature: T. Devasena, Enzymology, Oxford University Press, 2010

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 47 h.

Student's independent work: 28 h.