



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Biotechnology

Course

Field of study

Bioinformatics

Area of study (specialization)

-

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/4

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

30

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

6

Lecturers

Responsible for the course/lecturer:

prof. dr hab. inż. Ewa Kaczorek

Responsible for the course/lecturer:

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Faculty of Chemical Technology

Berdychowo 4, 60-965 Poznan

Prerequisites

The student should have basic knowledge of biology and chemistry of organic compounds. He/she is able to acquire information from indicated sources, interpret it properly and prepare conclusions.

Course objective

The student should have basic knowledge of biology and chemistry of organic compounds. He/she is able to acquire information from indicated sources, interpret it properly and draw conclusions.

Course-related learning outcomes

Knowledge

Graduates know and understand:



- basic biological phenomena and processes, and bases their interpretation on empirical foundations, using mathematical methods, including statistical and machine learning (K_W01)
- basics of biotechnological processes design and methods of their implementation, including the used apparatus and unit processes (K_W15)
- theoretical fundamentals of biological processes modeling (K_W17)
- social, economic and legal conditioning of their activities, including the issues of intellectual and industrial property protection (K_W21)

Skills

Graduates are able to:

- use basic laboratory techniques in synthesis, isolation and purification of chemical compounds, including bio-molecules and biologically active compounds (K_U03)
- use analytical, simulation and experimental methods to formulate and solve research tasks under the supervision of a supervisor (K_U07)
- use the language adequate to scientific discussions in communication with different environments (K_U10)
- to undertake work in an enterprise, individually and as a team, to plan and organize individual and team work, to observe safety rules related to this work (K_U17)

Social competences

Graduates are ready to:

- learn throughout life and improve their competences (K_K01)
- cooperate and work in a group, taking various roles in it (K_K02)
- determine priorities in order to implement a task defined by themselves or others (K_K03)
- think and act in an entrepreneurial way (K_K07)

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lectures end with a written exam. Laboratories - evaluation of the work during the performance of experiments and a written test of the knowledge necessary to conduct them.

Programme content

Lectures:

The course discusses issues related to the conduct of biotechnological processes and their use in various industries, including: the idea of the biotechnological process, unit operations in biotechnology, bioreactors (structure, types, control techniques), mathematical description and balancing of



bioprocesses; production of high value-added compounds, use of genetically modified organisms in biotechnology, bioenergetics

Laboratories:

During the course, students will perform practical exercises related to basic processes in biotechnology, selection of the most effective (micro)organism to carry out the process, establishment and control of cell culture, creation of mathematical models of culture, as well as isolation and purification of the final product and biomass management.

Teaching methods

Lectures end with a credit test including open and closed questions. Labs will be graded on the basis of knowledge colloquium and the performance of practical tasks and reports on the activities performed.

Bibliography

Basic

1. W. Bednarski, J. Fiedurek „Podstawy biotechnologii przemysłowej” Wydawnictwo NaukowoTechniczne
2. A. Chmiel „Biotechnologia” Wydawnictwo Naukowe PWN
3. J. Fiedurek "Procesy jednostkowe w biotechnologii. Ćwiczenia" Wydawnictwo Uniwersytetu Marii Curie-Skłodowskiej

Additional

1. J. Buchowicz "Biotechnologia molekularna" Wydawnictwo Naukowe PWN
2. S. Ledakowicz "Inżynieria biochemiczna" Wydawnictwo WNT

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,0
Classes requiring direct contact with the teacher	60	3,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	90	3,0

¹ delete or add other activities as appropriate