



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Cellular biology

Course

Field of study

Bioinformatics

Area of study (specialization)

-

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

Lecturers

Responsible for the course/lecturer:

dr inż. Wojciech Smulek

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 organic chemistry. They can obtain information from indicated sources, properly interpret them and draw conclusions.

Course objective

To acquaint students with the functioning of living cells, their structure and principles of functioning (life processes, division, etc.), taking into account differences and similarities between cells of organisms of different kingdoms



Course-related learning outcomes

Knowledge

Graduates know and understand:

- basic biological phenomena and processes, and their interpretation is based on empirical grounds, using mathematical methods, including statistical and machine learning (K_W01)
- cell structure and functions of cell structures, biochemical basis of metabolic pathways (K_W06)
- rules of inheritance, molecular mechanisms of replication and flow of genetic information and regulation of its expression (K_W05)

Skills

- integrate and interpret information obtained, draw conclusions and formulate and justify opinions (K_U02)
- apply basic laboratory techniques and tools to solve problems in bioinformatics, biotechnology and related disciplines, evaluate their usefulness (K_U05)
- apply analytical, simulation and experimental methods to formulating and solving research tasks under the guidance of a supervisor (K_U07)

Social competences

- lifelong learning and improving one's competences (K_K01)
- determine priorities in order to realize a task defined by oneself or others (K_K03)
- cooperate and work in a group, taking various roles in it (K_K02)
- take responsibility for own and others work safety; take appropriate actions in case of emergency (K_K06)

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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.

Programme content

Lecture: Discussion of prokaryotic and eukaryotic cell structure, including:

Functions of cell organelles. Organization and role of cytoskeleton. Cell movement apparatus. Molecular structure and function of the cell membrane and intracellular membranes. Mechanism of vesicular transport. Generation and transformation of energy in the cell. Organization of complex cellular structures and tissue. Intercellular communication. Homeostasis of the living cell. Process of cell division. Cellular stress, aging, apoptosis, and cell death.



Laboratory: Isolation of cells, preparation of cell and tissue microscopic preparations. Microscopic observations of prokaryotic and eukaryotic cells. Staining of cell preparations.

Teaching methods

Lecture: with multimedia presentation, discussion with students.

Laboratory: practical activities, working in teams, discussion with students.

Bibliography

Basic

- Alberts B. et al. Fundamentals of cell biology, Vol. 1 and 2, Wydawnictwo Naukowe PWN, Warsaw 2019
- Kilarski W. Strukturalne podstawy biologii komórkowych, Wydawnictwo Naukowe PWN, Warszawa 2012
- Klyszyko-Stefanowicz L. Cytobiochemistry, Wydawnictwo Naukowe PWN, Warsaw 1995

Additional

- Stokłosowa S. (eds.) Cell and tissue culture, Scientific Publishers PWN, Warsaw 2012
- Bukala B. Biology Cell chemical composition and structure, Szkolne Wydawnictwo Omega, Cracow 2020

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for laboratory classes, preparation for tests, raports preparation) ¹	55	2,0

¹ delete or add other activities as appropriate