UNIWERSYTET IM. ADAMA MICKIEWICZA W POZNANIU

From molecules to cells

Educational subject description sheet

Basic information

Field of study Biotechnologia	**Didactic cycle** 2022/23
Speciality -	**Subject code** WBBTES.12N.628610059cca5.22
Department Faculty of Biology	**Lecture languages** English
Study level First-cycle programme	**Mandatory** Elective
Study form Full-time	**Block** Subjects not assigned
Education profile General academic	

Subject coordinator	Johannes Bluijssen
Lecturer	Johannes Bluijssen, Krzysztof Leśniewicz, Hanna Kmita, Wiesława Jarmuszkiewicz, Piotr Ziółkowski, Małgorzata Borowiak, Jan Brezovsky, Savani Anbalagan

Period	**Activities and hours**	**Number of ECTS points**
Semester 2	• Lecture: 15, Graded credit • Conversatory classes: 15, Graded credit	2

Goals

Code	Goal
C1	To provide insight in the basic concepts of science combined with current state of the art technologies and biotechnological applications, which will lead the student from the structural basics of life, through the molecular machinery of the cells to some organismal aspects of biology. Wherever possible e-learning will be incorporated.
C2	Furthermore, students will extend and solidify their understanding of the presented principles through critical readings from the primary research literature, as well as student-prepared presentations of individual topics during journal clubs.
C3	Finally, students will take part in group discussions during lectures and journal clubs

Entry requirements

The course is thought of as a brief survey of the concepts of contemporary molecular and cellular biology and biotechnology. It is composed of 9 independent topics leading the student from the structural basics of life, through the molecular machinery of the cells to some organismal aspects of biology. The topics include:
DNA and replication, Transcriptomes and RNA, Molecular Machines, Molecules and mechanisms of epigenetics, Stem cells, Ligand-transport pathways in proteins, The energy of life and death, Genome medicine, Signaling in inflammation and cancer

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – Student knows and understands:			
W1	Obtain a working knowledge of the structural basics of life and science, from the concepts of contemporary molecular and cellular biology and biotechnology, through the molecular machinery of the cells, to some organismal aspects of health and disease.	BTE_K1_W04, BTE_K1_W07	Oral colloquium, Test
Skills – Student can:			
U1	Extend and solidify their understanding of the presented principles through critical readings from the primary research literature, as well as student-prepared presentations of individual topics during journal clubs.	BTE_K1_U03, BTE_K1_U05, BTE_K1_U06, BTE_K1_U08	Oral colloquium, Multimedia presentation
Social competences – Student is ready to:			
K1	Students will take part in group discussions during lectures and journal clubs	BTE_K1_K01, BTE_K1_K06	Oral colloquium, Test, Multimedia presentation

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	DNA and replication	W1, U1, K1	Lecture, Conversatory classes
2.	Transcriptomes and RNA	W1, U1, K1	Lecture, Conversatory classes

3.	Molecular Machines	W1, U1, K1	Lecture, Conversatory classes
4.	Molecules and mechanisms of epigenetics	W1, U1, K1	Lecture, Conversatory classes
5.	Ligand-transport pathways in proteins	W1, U1, K1	Lecture, Conversatory classes
6.	The energy of life and death	W1, U1, K1	Lecture, Conversatory classes
7.	Stem cells	W1, U1, K1	Lecture, Conversatory classes
8.	Genome medicine	W1, U1, K1	Lecture, Conversatory classes
9.	Signaling in inflammation and cancer	W1, U1, K1	Lecture, Conversatory classes

Course advanced

Activities	Teaching and learning methods and activities
Lecture	Lecture with a multimedia presentation of selected issues, Conversation lecture, Discussion
Conversatory classes	Lecture with a multimedia presentation of selected issues, Conversation lecture, Discussion

Activities	Credit conditions
Lecture	Lectures will be followed by a multiple choice test
Conversatory classes	Multimedia presentation will be followed by student group discussion

Literature

Obligatory

1. All knowledge will be provided during the lectures

Optional

1. No additional literature is provided

Calculation of ECTS points

Activity form	Activity hours*
Lecture	15
Conversatory classes	15
Preparation of a multimedia presentation	15
Preparation for the exam	15

Student workload	**Hours** 60
Number of ECTS points	**ECTS** 2

* hour means 45 minutes

Effects

Code	Content
BTE_K1_K01	The graduate is ready for krytycznej oceny posiadanej wiedzy i odbieranych treści z zakresu biologii i biotechnologii
BTE_K1_K06	The graduate is ready for współpracy z ekspertami z dziedzin pokrewnych
BTE_K1_U03	The graduate can stosować podstawowe techniki wykorzystywane w laboratoriach biologii molekularnej i biotechnologii
BTE_K1_U05	The graduate can proponować rozwiązania problemów biologicznych z zastosowaniem nowoczesnych metod biologii molekularnej i biotechnologii
BTE_K1_U06	The graduate can brać udział w dyskusji naukowej w oparciu o posiadaną wiedzę
BTE_K1_U08	The graduate can samodzielnie zdobywać wiedzę, dobierać odpowiednie źródła informacji oraz podnosić swoje kwalifikacje
BTE_K1_W04	The graduate knows and understands molekularne, biochemiczne, fizykochemiczne i komórkowe podstawy funkcjonowania organizmów
BTE_K1_W07	The graduate knows and understands nowoczesne metody stosowane w biotechnologii oraz analizie i inżynierii biocząsteczek