COURSE DESCRIPTION CARD - SYLLABUS

Course name
Introduction to Genetics [S1Bioinf1>GEN]

Course

Field of study
Bioinformatics

Year/Semester
1/1

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

A student beginning this course should understand the necessity of extending his/her competences. In addition, in terms of social competence the student must present such attitudes as honesty, responsibility, perseverance, cognitive curiosity, creativity, personal culture, respect for other people.

Course objective

The aim of the course is to provide students with the basic knowledge concerning molecular genetics, in particular: genetic concepts, molecular evolution and selected methods of genetic analysis. Additionally, introduce such elements as structure of genes, structure of genetic code, genetic material repair mechanisms and processes of replication, transcription and translation.

Course-related learning outcomes

Knowledge:
1. The student knows and understands basic genetic concepts, mechanisms of inheritance and selected methods of genetic analysis.
2. Has a knowledge, with theoretical basis in prokaryotic and eukaryotic gene structure, genetic code structure, molecular evolution, genomics, genetic material repair processes, replication, transcription

and translation processes.

Skills:
Is able to retrieve and interpret the information from a variety of sources concerning scientific literature and the Internet and to express and justify clearly and extensively his/her opinions on a wide range of subjects related to molecular genetics.

Social competences:
1. Exhibits a creative attitude in social and professional life.
2. Understands that in bioinformatics knowledge and skills become obsolete very quickly.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Forming evaluation
In lectures verifying established effects of the education is being carried out through: filing the written test with 5 questions / tasks to solve - every task 0-4 pt (tasks can consist of a few subsections - there is a then set fragmentary score for every subsection).

Programme content

The aim of the course is to present the basic issues concerning molecular genetics. The lectures will present basic concepts of classical genetics and methods of genetic analysis of higher organisms, bacteria and viruses. Then, the structure and role of DNA, mutations, DNA methylation, and the process of its replication, recombination and repair in prokaryotic and eukaryotic cells will be discussed, limited to the most essential information. The next step will be a discussion of the genetic code, as well as the structure of prokaryotic and eukaryotic genes, the processes of transcription and translation. Topics will be illustrated with examples. An introduction to molecular evolution will also
be presented, including concepts such as the origin of life on Earth or the genetic code.

Course topics

The course aims to introduce students to the concepts of molecular genetics. The lectures will cover basic concepts of classical genetics, genetic terminology (e.g., karyotype, chromosome, genome, genotype, etc.), the history of inheritance knowledge, and methods of genetic analysis for higher organisms, bacteria, and viruses. The structure and role of RNA and DNA, mutations, DNA methylation, and processes of replication, recombination, and repair in prokaryotic and eukaryotic cells will be discussed, limited to the most essential information.

The next step will involve discussing the genetic code, the structure of prokaryotic and eukaryotic genes, and the processes of transcription and translation. Basic concepts of genomics, topics such as ribozymes, transposable elements, proteins, enzymes, and the physical structure of genomes will also be covered. The topics will be illustrated with examples. Additionally, an introduction to molecular evolution will be provided, including concepts of the origin of life on Earth and the genetic code.

Teaching methods

Lecture illustrated by a multimedia presentation enriched with numerous examples.

Bibliography

Basic
Węgleński P. (red): Genetyka molekularna, PWN, Warszawa, 2017
Additional
Winter et al.: Genetyka - krótkie wykłady, PWN, Warszawa, 2012

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,50