BB2290 Molecular Biomedicine 7.5 credits

Molekylär biomedicin

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for BB2290 valid from Spring 2022

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Biotechnology

Specific prerequisites

Requirements for program students at KTH:
At least 150 ECTS from year 1, 2 and 3, of which at least 100 ECTS from year 1 and 2 and bachelor's degree work must be completed. The 150 ECTS must include completed courses in a program that includes: at least 20 ECTS in chemistry, 20 ECTS in biotechnology, biochemistry and molecular biology.

Requirements for non-programme students:
A total of 20 ECTS in biochemistry, microbiology and genetics / molecular biology. 20 ECTS in chemistry, as well as documented knowledge of English corresponding to English B.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After completing the course, the students will be able to

- Describe genome variation types and regulatory mechanisms
- Choose appropriate approaches and technologies for a given problem
- Explain mechanisms related to cancer
- Demonstrate critical reading skills in the context of scientific articles

For higher grades (>E), students should be able to

- Assess functional impact of genetic and epigenetic variants in health and disease
- Judge, assess genetic treatment approaches in a given context
- Summarise single and complex gene disorders
- Examine current genetic approaches/technologies to detect, treat diseases
- Examine role of genetic variation in drug response, metabolism

Course contents

The role of the genome and the epigenome in medicine will be in focus, both in health and disease conditions. Current and upcoming technologies to analyse genetic and epigenomic features will be discussed. The impact of genome variation will be exemplified with cancer, rare and complex diseases. Strategies for diagnosis and treatment of the diseases are covered, such as gene and stem cell therapy. Diseases related to polymerization and structural changes of proteins such as Alzheimer's disease and prion conditions will also be addressed.

The following subjects will be covered during the course

Human Genome Organisation & Principles of Genetic Variation
Principles of Gene Regulation and Epigenetics
Disease-causing genetic variants
Single gene disorders
Multifactorial disorders
Genetic Approaches to Treating Disease, including gene and cell therapy
Cancer

Examination

- LAB1 - Laboratory work, 1.0 credits, grading scale: P, F
- SEM1 - Project seminar, 2.0 credits, grading scale: P, F
- TEN2 - Written Exam, 4.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Other requirements for final grade

Attendance to seminar work(s) is mandatory to pass the course.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.