Course syllabus for

Genetics, 5 credits

Genetik, 5 hp
This course syllabus is valid from autumn 2021.
Please note that the course syllabus is available in the following versions:
Spring2019 , Autumn2019 , Autumn2020 , Autumn2021

Course code	5MT009
Course name	Genetics
Credits	5 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Molecular Life Science
Level	AV - Second cycle
Grading scale	Pass with distinction, Pass, Fail
Department	Department of Molecular Medicine and Surgery
Decided by	Programnämnden för biomedicinprogrammen
Decision date	2018-10-30
Revised by	Programme committee for study programmes in biomedicine
Last revision	2021-03-16
Course syllabus valid from	Autumn 2021

Specific entry requirements

A Bachelor's degree or a professional degree worth at least 180 credits. At least 10 credits should be in theoretical mathematics and 20 credits in life sciences (such as cell biology, biochemistry, microbiology or molecular biology). Proficiency in English equivalent to English B/English 6.

Objectives

The course provides students with a basic knowledge in human genetics and genetic disease mechanisms, as well as critical assessment and presentation of genetic research in both oral and written form.

On completion of the course, the student should be able to:

Regarding knowledge and understanding

- describe and explain the human genome organization, regulation and expression.
- explain how genetic variation occurs and its impact on health.
- determine different modes of inheritance of genes and traits

- identify suitable approaches to disease gene identification and disease mechanisms in the research field of human genetics
- discuss pros and cons of large sequencing projects and precision medicine as well as evaluate them from global health and United Nation's Sustainable Developmental Goals (SDGs) perspective.

Regarding skills and ability

- critically review relevant scientific literature and discuss the results and conclusions
- search for, collect, evaluate, interpret and discuss (in writing and orally) research data in relation to topics within the course
- extract genomic data from publicly available databases
- evaluate candidate variants and genes using publicly available databases and tools

Regarding judgement and approach

- reflect on ethical aspects of research involving human and animal material
- take responsibility for his/her own learning

Content

Throughout the course the students will be provided an introduction on genetic concepts with a focus on human genetics in life science. Different themes, such as genome organization, the origin and consequences of genetic variation and inheritance models, gene regulation, gene expression and current sequencing technologies will be presented and discussed in accordance with the course objectives.

The course is divided in the following partly overlapping parts: self-studies, lectures, computer exercises, student group work and oral presentations.

Teaching methods

The course is at master's level, where students are assumed to be familiar with the most common study methods in higher education. During this course, the learning will be an active process with integrated feedback. The course may also include elements of "flipped classroom" learning in which course material are provided before teacher-moderated discussions at workshops or seminars. The learning activities include seminars, lectures, virtual lab simulations and pre-recorded video lectures as part of "flipped classroom" and computer exercises. Particular emphasis is placed on peer-learning and self-studies in groups and at the individual level.

Examination

The examination consists of assessment of oral presentations (graded Fail/Pass/Pass with distinction) and take-home written assignment (graded Fail/Pass/Pass with distinction). Assignments and activities on the e-learning platform during the course will be scored, and the score on the e-learning platform will constitute 25% of the total score of the final written assignment . To pass the whole course the grade "Pass" must have been obtained for all parts of the course. To attain the grade "Pass with distinction" for the whole course, a grade of at least "Pass" must have been obtained for all examination parts of the course and the grade "Pass with distinction" must have been obtained for at least one examination part of the course.

Students must complete compulsory assignments in order to pass the course.

Students that fail to submit compulsory assignments in due time before the deadline will lose the opportunity to be graded with "Pass with distinction" for the course.

Compulsory participation
The introduction to the course, individual assignments, computer exercises, and group assignments as well as lectures linked to these parts are compulsory. The course examiner assesses if and, in that case, how absence from compulsory components can be compensated for. A student's study results cannot be finalised/registered until the student has participated in the compulsory components or compensated for their absence in accordance with the examiner's instructions. Absence from a compulsory component may mean that the student cannot compensate for absence until the next time the course is given.

If there are special grounds, or a need for adaptation for a student with a disability, the examiner may decide to deviate from the syllabus's regulations on the examination form, the number of examination opportunities, the possibility of supplementation or exemptions from the compulsory sections of the course etc. Content and learning outcomes as well as the level of expected skills, knowledge and abilities may not be changed, removed or reduced.

Other directives

The course language is English.

Course evaluation will be carried out in accordance with the guidelines established by theCommittee for Higher Education.

Literature and other teaching aids

Recommended literature

Latest review articles from high impact journals in the field of genetics and genomics. The articles will be provided during the course.

Strachan, Tom; Read, Andrew P.

Human molecular genetics

Fifth edition. : Boca Raton, Florida : CRC Press, 2019 - xiii, 770 pages
ISBN:0815345895 LIBRIS-ID:gq514rnfd2cr6zcw
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