



**Karolinska
Institutet**

Course syllabus for

Molecular and genetic mechanisms in nutrition science, 10 credits

Molekylära och genetiska mekanismer inom nutritionsvetenskap, 10 hp

This course syllabus is valid from autumn 2024.

Course code	4NT022
Course name	Molecular and genetic mechanisms in nutrition science
Credits	10 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Nutrition Science
Level	AV - Second cycle
Grading scale	Fail (U), pass (G) or pass with distinction (VG)
Department	Department of Medicine, Huddinge
Decided by	Education committee BioNut
Decision date	2024-03-05
Course syllabus valid from	Autumn 2024

Specific entry requirements

A Bachelor's degree or a professional degree equivalent to a Swedish Bachelor's degree of at least 180 credits in biomedicine, cellular and molecular biology, pharmaceuticals, medicine, nutrition, or the equivalent. And proficiency in English equivalent to English B/English 6.

Objectives

After completing the course, the student should be able to:

- discuss the role of nutrients in human metabolism and health from a molecular perspective.
- account for different current research areas in molecular nutrition.
- describe methods commonly used in the field of molecular nutrition and identify appropriate methods for answering different types of questions.
- answer a question in the area of molecular and genetic mechanisms underlying how diet affects health by searching for relevant scientific literature.
- compile and present, in writing and orally, a scientific report with an evidence-based approach to answer and critically discuss the above-mentioned question.

Content

This course deals with current scientific evidence on the relationship between dietary factors, metabolic and hormonal regulation, as well as cellular and molecular mechanisms that are important in the development and treatment of lifestyle-related diseases such as obesity, cardiovascular disease, diabetes, and cancer. This course also deals with the current methodology used in research on molecular and cellular mechanisms of nutrition, such as transcriptomics, proteomics, metabolomics, and CRISPR / Cas9-mediated gene modification. Biostatistics in connection with discussing scientific articles is also included. Ethical considerations in animal research is also included. During the course, the students will also receive training in presenting, discussing and communicating science in the area for the course.

Teaching methods

The course consists of lectures, seminars, journal clubs and individual assignments and group work.

Examination

The course is examined through written assignments (graded Pass/Fail), presentation and discussion of group work regarding molecular methods (graded Pass/Fail), as well as an individual written report (graded Pass with distinction/Pass/Fail) and oral presentation (graded Pass/Fail). To pass the course, all examination tasks must fulfil the criteria for Pass. Final grade is based on the written report. Grading criteria for all assignments are provided in Canvas.

In the case a student fails examination, the examination can be redone a maximum of five more times. After six failed assignments, no further examination opportunities will be given. The individual report can be complemented if failed; if the student has not submitted complementation of this at given deadline, grade Fail is given.

Compulsory participation:

Group work and journal clubs are compulsory. The examiner assesses if and, in that case, how absence from compulsory parts can be compensated. Before the student has participated in all compulsory parts or compensated absence according with the examiner's instructions, student's study results cannot be finalized. Absence from a compulsory activity may result in that the student cannot compensate absence until the next time the course is given.

If there are special reasons, or need for adaptations for a student with a disability, the examiner may decide to depart from the syllabus's regulations on examination form, number of examination opportunities, possibility of complementation of or exemption from compulsory activities, etc. Content and learning outcomes as well as the level of expected skills, knowledge and abilities must not be altered, removed or lowered.

Other directives

The course language is English.

This course replaces the course Molecular and genetic mechanisms in nutrition science, 10 credits (4NT001) and cannot be included in a degree together with the latter course.

Literature and other teaching aids

Reports, articles and other prescribed literature are listed at course start and will be available electronically.