

Medical Genetics

Programme course

7.5 credits

Medicinsk genetik

8MEA07

Valid from: 2017 Autumn semester

Determined by

The Board for First and Second Cycle
Programmes at the Faculty of Health
Sciences

Date determined

2012-12-07

Revision date

2014-10-06

Main field of study

Medical Biology

Course level

Second cycle

Advancement level

A1X

Course offered for

- Master's Programme in Experimental and Medical Biosciences

Specific information

In this course the student will acquire advanced theoretical and methodological knowledge in medical genetics and molecular mechanisms involved in, monogenic and polygenic traits and diseases. The course is elective semester three in the Master's Programme in Experimental and Medical Biosciences.

Entry requirements

The special eligibility requirement is the possession of the Degree of Bachelor of Sciences in a major subject area with relevance for biomedical sciences. This could include previous studies at faculties of medicine, technology/natural sciences, odontology or veterinary medicine. A major part of courses included in the Bachelor degree should be in subjects such as biochemistry, cell biology, molecular biology, genetics, gene technology, microbiology, physiology, immunology, histology, anatomy, and pathology.

Applicants must also have documented skills in English corresponding to the level of English in Swedish upper secondary education (English B). For applicants who have not studied in Swedish upper secondary education, skills in English are normally attested to by means of an international language test.

Intended learning outcomes

By the end of the course the students will be able to:

Knowledge and understanding

- Comprehend and integrate the knowledge on molecular mechanisms involved in monogenic and polygenic traits to understand the genetic basis of diseases
- Describe the interplay between genetic and environmental factors
- Explain how concepts of genetic variation in populations are affecting evolution and population genetics
- Identify strategies and explain the theoretical basis of molecular genetics methodology to be able to identify disease genes

Competence and skills

- Demonstrate how calculation of genetic association and risk is performed
- Apply computer-based methods to be able to identify disease genes
- Practically perform and explain selected molecular genetics methodology for gene identification

Judgement and approach

- Interpret experimental results and evaluate genetic association studies and risk calculations
- Present, evaluate and communicate pros and cons of molecular genetics methods
- Summarise and assess scientific literature within medical genetics

Course content

- Molecular mechanisms involved in monogenic and polygenic traits and diseases
- Disease gene identification
- How environmental factors influence the genome and affects expression
- Genetic variation in populations and its influence on genetic predisposition, including molecular/genetic epidemiology
- Calculation of allele frequencies, associations and risk
- Principles of major molecular genetic laboratory methods and interpretation of results, hands-on knowledge of selected methodology
- Seminars on selected scientific papers

Teaching and working methods

General: Linköping University Master's Programme in Experimental and Medical Biosciences applies student-centered learning among which Problem Based Learning (PBL) is one pedagogical philosophy and method. To prepare the students for future employment, practical and experimental work in laboratory settings are important parts of the programme in courses as well as in individual projects.

Specific: In this course, lectures, tutorial groups, seminars, demonstrations and laboratory work are used.

Examination

Compulsory items

Active participation in the compulsory parts is necessary to pass the course, and assessment of them is carried out continuously. Compulsory parts in this course are: tutorial groups, laboratory work, and seminars.

Examination

Individual written examination.

Oral presentation of a literature assignment (group assignment with individual assessment).

Written report and oral presentation of laboratory work (group assignment with individual assessment).

Scope of re-examination

The extent of a re-examination shall be similar to the regular examination.

Change of examiners

Students who have failed the course or part of the course twice are entitled to request another examiner for the following examination occasion, unless specific reasons are present.

Registration for examination

The procedure for registration should be stated prior to the commencement of each course. In other respects, regulations concerning examination and examiners are applied in accordance with Linköping University policy.

Grades

Three-grade scale, U, G, VG

Other information

The planning and implementation of a course must take its starting point in the wording of the course plan. The course evaluation included in each course must therefore take up the question how well the course agrees with the course plan.

The course is carried out in such a way that both men's and women's experience and knowledge is made visible and developed.

If the course is withdrawn, or is subject to major changes, examinations according to this course plan are normally offered on a total of three occasions within one year, one of them in close connection to the first examination.

Department

Institutionen för klinisk och experimentell medicin