Course syllabus for

Molecular Oncology and applied Biostatistics, 15 credits

Molekylär onkologi och tillämpad biostatistik, 15 hp
This course has been cancelled, for further information see Transitional provisions in the last version of the syllabus.
Please note that the course syllabus is available in the following versions:
Autumn2016 , Autumn2017

Course code	1BI030
Course name	Molecular Oncology and applied Biostatistics
Credits	15 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Biomedicine
Level	G2 - First cycle 2
Grading scale	Pass with distinction, Pass, Fail
Department	Department of Oncology-Pathology
Decided by	Programnämnd 7
Decision date	2016-03-23
Revised by	Programme committee for study programmes in biomedicine
Last revision	2020-06-10
Course syllabus valid from	Autumn 2017

Specific entry requirements

At least a grade of pass for the courses Introduction to Biomedicial Science, General and Organic Chemistry, Medical Biochemistry, Cell Biology and Genetics, Integrative Physiology, Tissue Biology, and Biostatistics, as well as having passed the parts Laboratory work and seminars (4 credits), and Project work (3 credits) within the course Infection and Immunity, and having passed the parts Pharmacokinetics and pharmacodynamics (2 credits), Laboratory work in pharmacology (1.5 credits) and Group assignments in pharmacology and toxicology (2.5 credits) within the course Pharmacology and Toxicology, within the Bachelor's Programme in Biomedicine.

Objectives

After the course the students should be able to:

Regarding knowledge and understanding

- describe general principles of cancer diagnostics and treatment,
- understand the basic processes underlying the transformation of a normal cell to its malignant counterpart, and the consequences of malignant transformation on the cellular and organism level,
- understand how the biological knowledge of cancer development is used in modern cancer treatment,
- show knowledge of laboratory techniques used in experimental cancer research,
- demonstrate knowledge in biostatistics and cancer epidemiology,

Regarding competence and skills

- show skills in relevant laboratory techniques used in experimental cancer research,
- use basic epidemiological research methods and describe their importance incomplementing other (e.g., laboratory) research investigations,
- use the principles of good experimental design to plan valid and efficient experimental studies,
- find relevant original and review articles in the subjects of molecular oncology, and to analyse, reflect upon, give feedback and compile data from these in e.g. an oral presentation,

Regarding judgement and approach

- have knowledge about and be able to discuss ethical aspects in relation to research covered in the course,
- demonstrate an ethical approach in experimental investigations.

Content

Molecular oncology
Tumor biology: Causes of cancer. Cancer related genes, including oncogenes and tumor suppressor genes; their normal cellular function, mutagenesis and consequences of their mutant state in cancer. Hereditary cancer. The stepwise transformation process. The biological behaviour of tumors. Cell cycle control and apoptosis. Tumor progression and metastasis. The interaction between malignant and normal cells. Tumor virology. Research methodology.

Oncology
Malignant diseases. Diagnosis. Molecular tumor pathology. The major treatment principles of cancer (surgery, radiotherapy, hormonal treatment, and biological therapy). Novel and developing treatment strategies. Ethics. Palliative treatment. Cancer epidemiology. Prevention. Clinical trials.

Biostatistics
Study design: Randomized controlled trial, cross-sectional study, case-control study, cohort study.
Epidemiological concepts: confounding bias, selection bias, mediation, interaction.
Statistical models and methods: linear regression (with ANOVA), logistic regression, proportional hazards regression.

The course is divided into the following parts:

Laboratory practicals, 5.0 hp

Grading scale: UG

Problem based seminars and group seminars, 5.0 hp

Grading scale: UG

Integration of molecular oncology and biostatistics, 5.0 hp

Grading scale: VU

Summative written examination of the different components of the course.

Teaching methods

The teaching includes lectures, patient demonstrations, problem based seminars, group seminars and laboratory practicals.

Examination

Laboratory practicals(5 credits). The examination consists of active participation. Graded Fail/Pass.

Problem based seminars and group seminars (5 credits). The examination consists of acitve participation. Graded Fail/Pass.

Integration of molecular oncology and biostatistics (5 credits). The examination consists of a written examination. Graded Fail/Pass/Pass with distinction.

The final grade for the whole course is based on the grade for the part Integration of molecular oncology and biostatistics. To pass the whole course, the grade pass must have been obtained for the other parts on the course.

Compulsory participation
Laborations, seminars, patient demonstrations and a written part exam covering the first parts of the course are compulsory. The course director decides if and how absence from compulsory components can be compensated. The component is not registered in LADOK unless the student has passed the compulsory component or compensated according to the course director's directions.

Limited number of examinations or practical training sessions
Students who have not passed the regular examination are entitled to participate in five more examinations. If the student has failed six examinations/tests, no additional examination or new admission is provided.

The number of times that the student has participated in one and the same examination is regarded as an examination session. Submission of a blank examination is regarded as an examination. An examination, for which the student registered but not participated in, will not be counted as an examination.

Transitional provisions

The course is cancelled and was offered for the last time HT17. Examination according to this syllabus will be offered for the last time VT21 for students who have not completed the course with a passing grade.

Other directives

The course language is English.

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

Oral evaluation in the form of course council meetings will be carried out during the course.

Literature and other teaching aids

Mandatory literature

Weinberg, Robert A.

The biology of cancer

2. ed. : New York : Garland Science, 2014 [dvs 2013] - 876, 6, 30, 28 s.
ISBN:9780815342205 (hft.) LIBRIS-ID:14608758
Library search