Course syllabus for

**Molecular oncology and biostatistics, 15 credits**
Molekylär onkologi och biostatistik, 15 hp

This course syllabus is valid from autumn 2013.
Please note that the course syllabus is available in the following versions:
**Autumn2009**, **Autumn2013**, **Autumn2014**

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<thead>
<tr>
<th>Course code</th>
<th>1BI011</th>
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<tr>
<td>Course name</td>
<td>Molecular oncology and biostatistics</td>
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<tr>
<td>Credits</td>
<td>15 credits</td>
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<td>Form of Education</td>
<td>Higher Education, study regulation 2007</td>
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<tr>
<td>Main field of study</td>
<td>Biomedicine</td>
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<tr>
<td>Level</td>
<td>G2 - First cycle 2</td>
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<tr>
<td>Grading scale</td>
<td>Fail (F), fail (Fx), sufficient (E), satisfactory (D), good (C), very good (B) or excellent (A)</td>
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<tr>
<td>Department</td>
<td>Department of Oncology-Pathology</td>
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<tr>
<td>Decided by</td>
<td>Programnämnden för biomedicinprogrammen</td>
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<tr>
<td>Decision date</td>
<td>2009-05-06</td>
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<td>Revised by</td>
<td>Programme Committee 7</td>
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<td>Last revision</td>
<td>2013-09-11</td>
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**Specific entry requirements**

At least grade E (pass) for the courses Introduction to Biomedical Science, General and Organic Chemistry, Medical Biochemistry, Cell Biology and Genetics, Integrative Physiology, Tissue Biology and Biostatistics. Passed part one within the course “Infection and Immunity” and passed 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 with toxicology.

**Objectives**

After the course the students should be able to:

- 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 and skills in laboratory techniques used in experimental cancer research,
• demonstrate knowledge in cancer epidemiology,
• use basic epidemiological research methods and describe their importance in complementing other 
  (e.g., laboratory) research investigations,
• use the principles of good experimental design to plan valid and efficient experimental studies, 
• have knowledge about and be able to discuss ethical aspects in research.

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 
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 

Biostatistics
Observational Studies: Introduction to Epidemiology, study design; rates, risks and proportions; 
  measures of association; confounding, effect modification and stratification; presenting time-to-event 
  (survival) data; current controversies regarding cancer risk; analysis of real oncology data.

Experimental Studies: Randomized clinical trials; randomization, blocking and blinding, placebo effect, 
  intention-to-treat; designed experiments: completely randomized design, randomized block design, 
  factorial experiments, interaction, screening; data analysis.

The course is divided into the following parts:

Laboratory practicals, 5 hp

Problem based seminars and group seminars, 5 hp

Integration of molecular oncology and biostatistics, 5 hp
  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 active 
participation. Graded Fail/Pass.
Integration of molecular oncology and biostatistics (5 credits). The examination consists of a written examination. Graded A-F.

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 (grade E or above), 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 directors 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 is not approved after four examinations, he/she is recommended to retake the course at the next regular course date, and may, after that, participate in two 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
After each course occasion there will be at least six occasions for the examination within a two-year period from the end of the course.

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
ISBN:9780815342205 (hft.) LIBRIS-ID:14608758
Library search