

VMFN29, Advanced Cancer Biology, 30 credits

Avancerad cancerbiologi, 30 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by The Master's Programmes Board on 2017-09-13 (U 2017/422). The syllabus comes into effect 2017-09-13 and is valid from the autumn semester 2018.

General information

Freestanding course. The course is intended as a preparation for third cycle studies in relevant fields at faculties of medicine, science or engineering and for students with a first or second cycle degree in science, biomedicine or medicine.

The course is delivered full-time.

Language of instruction: English

<i>Main field of study</i>	<i>Specialisation</i>
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Biomedicine	A1N, Second cycle, has only first-cycle course/s as entry requirements
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Learning outcomes

The aim of the course is to enable students to acquire specialised theoretical and practical knowledge of cancer biology, from basic research to clinical applications of research findings. A further aim of the course is to provide students with practical laboratory experience through a project related to cancer.

Knowledge and understanding

For a pass on the course, the students shall be able to

- define the concept of neoplasia from the perspectives of clinical practice, morphology and molecular biology
- account for the terminology used to classify tumour diseases and current methods within tumour diagnosis

- explain the molecular mechanisms currently known to cause cancer, including common risk factors, cancer etiology and the distinctive biological properties of cancer cells
- compare the biological properties of tumour cells and normal stem cells and, based on this, critically discuss the concept tumour stem cell from the perspectives of research, clinical practice and cell biology
- account for the most common experimental and bio-informatic methods of present-day cancer research, including animal models, and explain the theories behind the methods in sufficient detail to allow the strengths, weaknesses and appropriate applications to emerge
- provide examples of current issues in cancer research, explain the relevance of these issues from clinical and ethical perspectives, and describe the general scientific history of the issues

Competence and skills

For a pass on the course, the students shall be able independently to

- formulate a timely research question in the area of cancer research, select relevant methods to address the issue and, based on this, write a project plan including relevant background information, an appropriate aim, and a realistic work plan
- employ laboratory methods of relevance to the execution of a project within cancer research
- independently document research results from a project within cancer research
- compile, critically analyse and assess research results
- write a report about a scientific project in accordance with the instructions of a scientific journal
- present a scientific project orally and with illustrations, at a level adapted to the background knowledge of their peers
- identify and analyse the ethical issues of a research project related to cancer and determine if it requires ethical vetting

Judgement and approach

On completion of the course, the students shall be able to

- argue for the need of documentation of experimental activities
- assess scientific information within the field of cancer
- assess ethical aspects of a research project within the field of cancer

Course content

The course starts with 2 weeks of preparation of the project work and lectures and seminars led by experienced researchers and physicians. The students select a project from a set of available projects and write a project plan that is to be approved by the planning group. This is followed by the laboratory component of the course which is combined with seminars and group work. The aim of the group work is to continually follow up the project work with regard to supervision, data collection and practical research methodology. The students are required to actively prepare the

seminars/group work through reading and review of hand-outs and/or texts produced by the students for submission and assessment, followed by individual oral and written feedback.

Course design

Each student will be assigned an experienced cancer researcher as her or his personal adviser. The teaching consists of lectures, seminars, group work, reading assignments, presentations related to current research fields and project work that includes laboratory components.

All timetabled activities except lectures are compulsory.

Assessment

The assessment is based on four components: two written exams, a course portfolio and a project that is to be presented in speech and writing.

The written exams are used to assess the learning outcomes of knowledge and understanding. The course portfolio is used to assess the learning outcomes of competence and skills, judgement and approach, through active participation in group work, oral presentations, written assignments on ethical aspects related to the project, and a certificate of skill from the host laboratory regarding experimental work and documentation.

Examinations:

- Written exam (4.5 credits)
- Project plan (2 credits)
- Course portfolio (7.5 credits)
- Written and oral presentation of project work (16 credits)

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Grades

Grading scale includes the grades: Fail, Pass

Entry requirements

To be admitted to the course, students must have a Bachelor's degree (180 credits) in a field of science, biomedicine, medicine or the equivalent. To enter the course, students must have performed a research project during their previous studies and should be capable of basic scientific reflection, as evaluated through a specific selection process. International students are exempted from the general entry requirement of proficiency in Swedish but all students are required to have proficiency in English corresponding to English 6 from Swedish upper secondary school.

Further information

Required reading: Journal articles presenting original research and surveys. Required reading is presented prior to the start of the course and throughout the course.