

# Syllabus

for course at advanced level

**Stem Cells in Developmental- and Cancer Biology**  
**Stamceller i utvecklings- och cancerbiologi**

**15.0 Higher Education  
Credits**  
**15.0 ECTS credits**

|                          |                                                                         |
|--------------------------|-------------------------------------------------------------------------|
| <b>Course code:</b>      | BL7047                                                                  |
| <b>Valid from:</b>       | Autumn 2015                                                             |
| <b>Date of approval:</b> | 2015-08-21                                                              |
| <b>Department</b>        | Department of Biology Education                                         |
| <b>Main field:</b>       | Biology                                                                 |
| <b>Specialisation:</b>   | A1N - Second cycle, has only first-cycle course/s as entry requirements |

## Decision

This syllabus has been approved by the Board of the Faculty of Science at Stockholm University.

## Prerequisites and special admittance requirements

Admittance to the course requires knowledge equivalent to 30 credits in Chemistry, including 7,5 credits in Biochemistry, Cell and Molecular Biology 30 credits and additionally 15 credits in Molecular Biology/Molecular Life Sciences. (Three credits corresponds to approximately two weeks full-time studies). Swedish upper secondary school course English B/English 6 or equivalent.

## Course structure

| Examination code | Name                                            | Higher Education Credits |
|------------------|-------------------------------------------------|--------------------------|
| HELA             | Stem Cells in Developmental- and Cancer Biology | 15                       |

## Course content

The course covers the molecular mechanisms regulating the division and differentiation of stem cells in development and cancer. Mechanisms of cell differentiation and de-differentiation, reprogramming, induction of pluripotent cells, and the signaling pathways controlling these processes will be discussed. Important aspects of stem cell regulation, such as epigenetic changes, the presence of a niche, and asymmetric cell division will be covered.

## Learning outcomes

It is expected that the student after taking the course will be able to:

- Explain basic concepts in stem cell biology; these include cell differentiation and de-differentiation, pluripotency, the stem cell niche, signaling, and asymmetric cell division.
- Describe the importance of model organisms for central concepts in stem cell biology.
- Compare epigenetic changes with gene expression differences during differentiation and de-differentiation of stem cells and during embryo development.
- Discuss how the concept of cancer stem cells influences our view of how cancer arises and is treated.

## Education

The education consists of lectures, seminars, exercises and laboratory exercises. Participation in seminars, exercises, laboratory exercises and group education associated with this is compulsory. An examiner may rule that a student is not obliged to participate in certain compulsory education if there are special grounds for this.

after consultation with the relevant teacher.

### **Forms of examination**

a. Examination for the course is in the following manner: measurement of knowledge takes place through: Written examination as well as written and oral presentations.

If the instruction is in English, the examination may also be conducted in English.

b. Grading is carried out according to a 7-point scale related to learning objectives:

A = Excellent  
B = Very Good  
C = Good  
D = Satisfactory  
E = Sufficient  
Fx = Fail  
F = Fail

c. Grading criteria for the course will be distributed at the start of the course.

d. A minimum grade of E is required to pass the course, together with:

- participation in all compulsory education

e. Students who fail an ordinary examination are entitled to sit additional examinations as long as the course is offered. There is no restriction on the number of examinations. Examinations also include other obligatory elements of the course. Students who have passed an examination may not resit it in order to achieve a higher grade. Students who have failed on two occasions are entitled to request the appointment of a different examiner for the next examination. Any such request must be made to the departmental board. The course has at least two examinations (if required: for each element) for each academic year in the years in which instruction is provided. Intervening years include at least one examination.

f. f. Students awarded the grade Fx are given the opportunity to improve their grade to E. The examiner decides the supplementary assignments to be performed and the pass mark criteria. The supplementary assignments will take place before the next examination session.

### **Interim**

Students may request that the examination is carried out in accordance with this syllabus even after it has ceased to apply. This right is limited, however, to a maximum of three occasions during a two-year-period after the end of giving the course. A request for such examination must be sent to the departmental board.

### **Limitations**

The course can not be included in a degree together with the course Stem cells in developmental- and cancer biology 15 hp (BL7028) or the equivalent.

### **Misc**

The course is part of the Master's Programme in Biology and Molecular Life Sciences, but can also be read as a separate course.

### **Required reading**

Course literature is decided by the departmental board and is described in an appendix to the syllabus.