



## DEPARTMENT OF CHEMISTRY AND MOLECULAR BIOLOGY

### **BIO440 Eukaryotic Molecular Microbiology, 15 higher education credits**

Eukaryot molekylär mikrobiologi, 15 högskolepoäng

*Second Cycle*

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#### **Confirmation**

This course syllabus was confirmed by Department of Chemistry and Molecular Biology on 2014-06-11 and was last revised on 2017-07-04 to be valid from 2017-07-06, spring semester of 2017.

*Field of education:* Science 100%

*Department:* Department of Chemistry and Molecular Biology

#### **Position in the educational system**

This is an advanced course that can be included as part of a Bachelor's degree in Biology or Molecular Biology, or as part of a Master's degree in Biology, Molecular Biology or Genomics and Systems Biology. The course can also be taken as a freestanding course.

#### *Main field of studies*

Molecular Biology

Biology

Molecular Biology with Specialization in Genomics and Systems Biology

#### *Specialization*

A1N, Second cycle, has only first-cycle course/s as entry requirements

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#### **Entry requirements**

Students must have successfully completed the basic courses Cell Biology, BIO900, 15 hec, Molecular Genetics, BIO905, 15 hec, Biological Form and Function, BIO910, 15 hec, Ecology and Evolution, BIO915, 15 hec, and Biodiversity and Systematics, BIO920, 15 hec plus Chemistry, 30 hec or other equivalent courses.

English proficiency is required to the level of English 6/English Course B from Swedish Upper Secondary School, or be certified by an international recognized test, for example TOEFL, IELTS. In addition, completion of any of the advanced courses Microbiology, 15 hec, Molecular Biology, 15 hec, Biochemistry, 15 hec, or other equivalent courses.

### **Learning outcomes**

After completing the course the students will be able to:

#### *Knowledge and understanding*

- Demonstrate advanced knowledge of experimental strategies, of applications and tools of genetics, cell biology, functional genomics, and systems biology and of the role of yeast as a model system for higher eukaryotes.
- Ability to perform a number of standard lab techniques and to analyze, report and discuss the results of the experiments.

#### *Skills and abilities*

- Demonstrate ability to independently search, read, understand and critically analyze scientific literature and information.
- Demonstrate ability to present, explain and discuss scientific topics and research issues in eukaryotic molecular microbiology.
- Demonstrate advanced knowledge of and ability to explain complex molecular, genetic and genomic processes in eukaryotic microorganisms.

#### *Judgement and approach*

- Critically evaluate and judge the quality of data and conclusions presented in primary research articles and scientific reports.

### **Course content**

The course aims at detailed understanding of molecular and cell biology, genetics, functional genomics, and systems biology of eukaryotic microorganisms focusing on yeast and other fungi as model systems.

The topics covered include cellular regulatory systems such as signal transduction processes, control of gene expression, stress responses, cell cycle control as well as subcellular organization and structures, and organelles.

An important aspect of the course is to present experimental strategies and applications including genetic analyses, tools for molecular and cell biology analyses, functional genomics and systems biology, as well as to illuminate the importance of yeast as a model system for higher eukaryotes.

**Form of teaching**

The course is composed of lectures, exercise sessions, group discussions, seminars, individual projects and laboratory work. The students will be trained in searching, reading, understanding, evaluating and presenting scientific information to others. All items except lectures are compulsory.

*Language of instruction:* English

**Assessment**

All the separate items of the course (e.g. exercise sessions, group discussions, individual projects and laboratory work) will be assessed during the course.

Missed compulsory sessions may be made up during the course when that is possible, or the next time the course runs.

A student who has failed a test twice has the right to change examiner, if that is possible. A written application should be sent to the Department.

In cases where a course has been discontinued or major changes have been made a student should be guaranteed at least three examination occasions (including the ordinary examination occasion) during a time of at least one year from the last time the course was given.

**Grades**

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

**Course evaluation**

The results of the evaluation will be communicated to the students and will function as a guide for the development of the course.