



## Course memo

### FCB3003 Higher Seminar in Industrial Biotechnology III, 3,0 hp

#### Course main content

Industrial biotechnology is a broad research area with a strong connection to sustainable development, where the doctoral students' projects cover both fundamental and applied research within e.g. bioprocess technology, metabolic engineering, biocatalysis, enzyme technology, and identification and characterization of enzymes for sustainable bioprocesses and drug discovery.

The course aims to provide both broad and specialized knowledge within the students' own research areas in industrial biotechnology and that of the general subject area of biotechnology, as well as knowledge of academic authorship and the international scientific publishing landscape. The course is the first of four courses in the seminar series.

The course comprises approximately 80 full-time study hours and normally extends over an academic year with regular meetings during study-term periods. The course assumes the form of higher seminar where the doctoral students present, interpret, analyze, critically examine and actively discuss mainly their own work, but also other relevant research literature within the research field. An important aspect is that the research students receive constructive feedback on their own scientific work.

At each session, a doctoral student presents his/her own work, or if this is not possible another scientific article, where the background, method, results and conclusions are summarized in an educational and concise manner. Anyone who presents can have a desire to get feedback on specific parts of the work, but the group should also discuss the work in its entirety.

Because of the diversity in research background of the student group, considerable consideration should be given to the pedagogical aspect of the seminar. Furthermore, aspects relating to research ethics, social and sustainable relevance should always be identified, highlighted and discussed at the seminar sessions. In addition to critically reviewing the scientific content, the work's format, language, disposition and presentation as well as publishing technical aspects should also be reviewed and discussed.

The work to be examined must be submitted to all participants well in advance before the session. All participants are expected to read and reflect on the material, as well as to prepare comments and questions. In cases where a doctoral student's own manuscript or article is presented, all participants should, in addition to actively participate in the discussion, also record their views and comments in writing before the seminar.

#### Intended learning outcomes

After completion of the course the student should be able to

- demonstrate both broad and specialized knowledge in the overall subject area of biotechnology with emphasis on industrial biotechnology
- demonstrate the ability to present pedagogically, critically examine and discuss their own and others' scientific work in the subject of biotechnology with emphasis on research in industrial biotechnology
- demonstrate the ability to acquire knowledge of academic authorship and the international scientific publishing landscape with relevance to the scientific focus area of the course
- demonstrate the ability to identify, discuss and reflect on ethics and sustainability aspects in the research that is discussed within the framework of the scientific focus area of the course

## **Criterion-based grading criteria**

### Grade E (Pass)

- When participating in discussions, the doctoral student can show a basic understanding and insight about different research areas with industrial relevance in the field of biotechnology, and in his own field of research contribute with specialized subject knowledge.
- The doctoral student is able to present his or her own research results and / or other research literature orally in at least a basic pedagogical way. In addition, the doctoral student can actively participate in a critical review of their own and others' scientific work, and present constructive views.
- The doctoral student can show understanding and knowledge of academic writing, outline, handling of graphic information and references, peer review, etc. in relation to his / her completed study time aspects of the authoring and publishing process.
- The doctoral student can show a fundamental ability to identify problems in ethics and sustainability in general, and in his own research area in particular. Such insights can be shown in many ways, e.g. by providing suggestions on how data processing and presentation can be improved, reflections on how the author has chosen to handle experimental controls, or on risks associated with data interpretation, how a research result can lead to added value economically, socially or environmentally, pointing out any environmental risks or ethical dilemmas with a completed study, etc.

## **Examination**

DEL1 – Attendance, 3,0 hp, grades: P/F

## **Requirements for final grade**

Active participation at 80% of the seminar sessions, which includes presenting, preparing and actively participating in reviewing and discussing selected scientific work.

## **Literature**

Literature in the form of the students' own scientific work and published articles are assigned separately for each individual session.

## **Course responsible**

Christina Divne, divne@kth.se

## **Examiner**

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