



## **MSc in Resource Recovery - Industrial Biotechnology**

### **Masterutbildning i energi- och materialåtervinning - industriell bioteknik**

120 credits

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**Ladok Code:** KMAKB

**Version:** 4.1

**Level:** Second cycle

**Approved by:** Board of the department 2010-11-22

**Valid from:** Autumn 2010

**Valid for:**

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### **General Objectives**

Second level education shall essentially build on the knowledge that students acquire in first level education or corresponding knowledge. Second level education shall involve a deepening of knowledge, skills and abilities relative to first level education and, in addition to what applies to first level education, shall

- further develop the students' ability to independently integrate and use knowledge,
- develop the students' ability to deal with complex phenomena, issues and situations, and
- develop the students' potential for professional activities that demand considerable independence or for research and development work.

(The Higher Education Act, Chapter 1, Section 9)

### **Objectives**

Objectives: The education is intended to give the student knowledge and skills to be able to introduce systems and technology favourable to a sustainable development. The central focus of the programme is biotechnical methods. The education is also intended to prepare the student for PhD studies.

Upon graduation, the student is expected to:

- be well prepared for PhD studies,
- have adequate knowledge in materials issues with regard to a sustainable development
- have adequate knowledge about biopolymers,
- have acquired experience and knowledge about planning of biotechnical facilities and have obtained knowledge in shaping a biotechnical process from a desired microbial product,
- have adequate knowledge about biological techniques to solve problems concerning waste,
- have an in-depth ability to apply molecular biotechnology in practice within traditional areas of business but also within areas of business where biotechnology isn't the primary choice of technology,
- have acquired experience of working in projects,
- orally and in writing be able to present projects and investigations in English.

### **Content**

The courses that the programme comprises are listed below.

A course comprises 7.5 ECTS credits unless otherwise stated.

#### **Study year 1**

- 1) Overview of Sustainable Development
- Industrial Microbiology
- Resource Recovery
- Molecular Biology
- Molecular Biotechnology, 15 ECTS credits
- Biopolymers
- Biological Treatment of Waste and Residual Products

1) Students who lack prerequisites in Chemical Engineering study Energy Technology during period 1 and Process Technology during period 2.

Students who have taken courses equivalent to Industrial Microbiology and Molecular Biology take Applied Surface Chemistry in period 1 and Project course - Research and Method Industrial Biotechnology in period 2.

### **Study year 2**

- Measurements and statistics
- Bioprocess Design, 15 ECTS credits
- Protein Science and Technology
- Degree Thesis, 30 ECTS credits

### **Admission Requirements**

Degree of Bachelor of Science in Engineering with a specialisation in chemical engineering or a Degree of Bachelor of Science in Chemistry, comprising a minimum of 180 credits, or equivalent.

Verified knowledge of English corresponding to the course *English B* in the Swedish Upper Secondary School *or* a Bachelor Degree from a university in Sweden, Denmark, Norway, Finland or Iceland.

For further information about English language proficiency, please view: <http://www.hb.se/wps/portal/engtest>

### **Degree**

Degree of Master of Science (Two Years) with a major in Energy and Material Recovery - specialisation Industrial Biotechnology.

Degree certificates are issued upon application in Ladok for students. More information is available at [www.hb.se](http://www.hb.se).

### **Student Influence and Evaluation**

Every course in the programme is evaluated (see to the university policy on course evaluation). The head of the programme is responsible for regularly and in a systematic fashion collecting the student's opinions on the education. The head of the programme, along with the prefect, is also responsible for evaluating the whole programme on a yearly basis. The evaluation is carried out in cooperation with the programme's teacher, the students and professional representatives. The evaluation is documented in writing and brought back to the students.

### **Miscellaneous**

Study language: English.

The language of instruction is English.