



SLUkurs

Biology with specialisation in Biotechnology - Bachelor's Programme

Version 1. Is valid from autumn 2013

Programme code:

NK002

Scope:

180 ECTS

Level affiliation:

1 - First cycle

Degree

Degree of Bachelor of Science

Responsible faculty:

Faculty of Natural Resources and Agricultural Sciences

Appendices

- Appendix for students admitted in 2013 autumn term
- Appendix for students admitted in 2014 autumn term

1. Decision

The Board of the Swedish University of Agricultural Sciences decided on 12-13 June 2006 to set up the bachelor programme biotechnology. Rector decided on 4 July 2012 to change the name to Biology with specialisation in biotechnology – Bachelor's programme.

The programme syllabus was approved by the Faculty Board at the Faculty of Natural Resources and Agricultural Sciences on 21 March 2007, to be valid from the 2007/2008 academic year. The programme syllabus was revised on 24 September 2007, 17 December 2007, 10 May 2010, 29 June 2012 (reg.no. SLU ua Fe.2012.3.0-2311) and 4 July 2012 (reg.no. SLU ua Fe.2012.3.0-2333). The latest revision is valid from the academic year 2013/2014.

The Biology with specialisation in biotechnology programme leads to a Degree of Bachelor comprising 180 credits. The programme has the following programme code: NK002

2. Prior knowledge and other requirements

2.1 Previous studies

Admission to the Biology with specialisation in biotechnology – bachelor’s programme requires, besides general entry requirements, special entry requirements as specified in field-specific entry requirements 14:

- Biology B
- Physics A
- Chemistry B
- Mathematics D

Alternative special entry requirements as specified in field-specific entry requirements A11:

- Biology 2
- Physics 1a or Physics 1b₁+1b₂
- Chemistry 2
- Mathematics 4

Grade requirements: in each individual course above, the applicant must have earned at least a pass grade.

There are more options for replacement courses in the field-specific entry requirements. In addition, weighted courses as specified in the different field-specific entry requirements are taken into account.

The requirements for special entry requirements as described above can also be fulfilled with corresponding qualifications from current or earlier Swedish education. The requirement can also be fulfilled if the corresponding knowledge has been acquired in some other way.

Admission to the different courses included in the programme is subject to individual eligibility requirements for each one.

3. Intended learning outcomes

3.1 General learning outcomes

In accordance with the Swedish Higher Education Act (Chapter 1, Section 8), first-cycle programmes “shall develop the students’

- ability to make independent and critical assessments,
- ability to independently perceive, formulate and solve problems, and
- preparedness to deal with change in working life.

In the educational field concerned, in addition to knowledge and skills, students shall develop an ability to

- seek and evaluate knowledge at a scholarly level,
- follow the development of knowledge, and
- exchange knowledge with other people, including people without specialist knowledge of the field.”

3.2 Specific learning outcomes for a Degree of Bachelor

In accordance with the supplement to the Ordinance for the Swedish University of Agricultural Sciences (SLU), the student must achieve the following learning outcomes for a Degree of Bachelor:

Knowledge and understanding

For a Degree of Bachelor the student must

- demonstrate knowledge and understanding in the main field of study, including knowledge of the scientific basis of the field, knowledge of applicable methods in the field, specialised knowledge of some part of the field, and a general knowledge of current research issues.

Competence and skills

For a Degree of Bachelor the student must

- demonstrate the ability to seek, evaluate and analytically interpret relevant information about a given problem, and analytically discuss circumstances, issues and situations;
- demonstrate the ability independently to identify, formulate and solve problems, and to complete assignments within the given time limits;
- demonstrate the ability, orally and in writing, to present and discuss information, problems and solutions in dialogue with different groups; and
- demonstrate such skills as are required for independent work in the programme’s main field.

Judgement and approach

For a Degree of Bachelor the student must

- demonstrate the ability to make assessments in the main field of study, taking account of relevant scientific, social and ethical aspects;
- demonstrate insight into the role of knowledge in society and into people’s responsibility for how it is used; and
- demonstrate the ability to identify his/her need of further knowledge and to develop his/her skills.

3.3 Detailed learning outcomes for the Bachelor’s programme in Biology with specialisation in biotechnology

Within the framework of the learning outcomes in the qualification description, SLU has further specified the following learning outcomes for the Bachelor's programme in Biology with specialisation in biotechnology:

Knowledge and understanding

For a Degree of Bachelor, the student shall

- demonstrate knowledge and understanding of biology, in particular biotechnology, including knowledge about the scientific basis for the subject and orientation in current research issues,
- demonstrate such understanding of chemistry, biochemistry, cell biology, microbiology, genetics and physiology as is required to understand the molecular basis of the genome and how genes and cells together impact on the phenotype of an organism,
- demonstrate the knowledge about applicable molecular biology methods that is required in order to work with their implementations and to be able to carry on studies within the area at advanced level,
- demonstrate in-depth knowledge about gene technology.

Competence and skills

For a Degree of Bachelor, the student shall

- demonstrate ability to search, collect, evaluate and critically interpret information in problems of relevance to biotechnology and critically discuss phenomena and issues within the area in question,
- demonstrate ability to independently and critically identify and formulate problems and to identify and use biotechnology methods to solve problems within given resource frameworks, particularly in the area of molecular biology,
- demonstrate ability to carry out laboratory work in a scientific and safe manner,
- demonstrate ability to produce summaries and carry out simple statistical analysis of biological data,
- demonstrate ability to use the Swedish technical language used by speaking and writing about biotechnology issues in a scientific and popular scientific manner,
- demonstrate ability to explain the content of scientific literature in English,
- demonstrate ability to communicate problems, analyses and solutions to various target groups,
- demonstrate understanding of the requirements placed by the potential labour market on its professionals,
- demonstrate ability to work in project form and to plan and organise his/her work.

Judgement and approach

For a Degree of Bachelor, the student shall

- demonstrate a critical attitude, where opinions and measures are based on scientific fact,
- demonstrate ability to make assessments relating to the use of biotechnology, in relation to agriculture and society as a whole,
- demonstrate ability to make ethical assessments when using biotechnology methods,
- demonstrate insight into the role of knowledge in humankind's sustainable use of biological natural resources,
- demonstrate understanding of his/her own need for competence development.

4. Possibilities for further study

A student who has completed the Biology with specialisation in biotechnology – bachelor's programme with a Degree of Bachelor meets the specific entry requirements for admission to further studies in the following types of programmes at SLU

- Master's programme, 60 credits
- Master's programme, 120 credits

The available programmes are specified in Supplement 1, which is approved by the Study Programmes Board.

5. Content and outline

5.1 Courses

The courses included in the Bachelor's programme in biology with specialisation in biotechnology are approved by the Study Programmes Board and presented in a supplement to the programme syllabus which also contains a description of the programme structure (framework timetable). Intended learning outcomes and course content are presented in the syllabus for each course.

5.2 Outline

The programme provides a basic foundation of natural science, on which the students in the third year carry out in-depth study of biotechnology. The content of the studies stretch from molecules via genes to organisms. Laboratory work constitute an important part of the programme, as this teaches students to handle the tools they will be using in their professional life.

Besides the more subject-specific sections, the students learn to search for, acquire and evaluate relevant literature, and to report their own and others' results in written and oral form.

Independent project (degree project)

The studies conclude with an independent project (degree project), where the student can implement his/her knowledge, abilities and attitudes on a current issue

within biotechnology. Further instructions for the independent project are shown in the Appendix, which is set by the Study Programmes Board.

6. Examination

Each course includes one or several tests. The terms U, 3, 4 or 5 are used for grading the courses, unless there is an exemption decision. Grading criteria are described in a supplement to each course syllabus.

Grades are determined by an examiner appointed by SLU. General rules and guidelines for assessment and grading are presented in internal directives for grading systems and examination rights and in regulations governing education on the first and second cycles at SLU.

7. Degree

7.1 Degree awarded after completion of the study programme

A Bachelor's degree with biology as the main field, in accordance with the programme syllabus for the Bachelor's programme in biology with specialisation in biotechnology, is awarded to students who complete the course requirements (pass courses) comprising 180 credits according to the following:

- a minimum of 60 credits for courses in biology (G1N; G1F)
- a minimum of 15 credits for courses with a biology specialisation (G2F),
- a minimum of 15 credits for independent work in biology (degree project / G2E),
- a maximum of 30 credits may be for passed courses at the second-cycle level.

Course requirements further include the following:

- 120 credits for programme courses according to the approved study plan,
- a minimum of 30 credits eligible programme courses according to the approved study plan,

Course requirements further include the following:

- 120 credits for programme courses according to the approved study plan,
- a minimum of 30 credits eligible programme courses according to the approved study plan,
- independent work in biology according to the approved study plan and instructions for the programme.

A student who fulfils the requirements for a Degree of Bachelor will, upon request, receive a degree certificate. The degree certificate will specify the qualification as a Degree of Bachelor with a major in biology.

The degree certificate must further specify that the qualification fulfils the requirements according to the programme syllabus for the Bachelor's programme in

biology with specialisation in biotechnology. Detailed course requirements are included in the study plan, which is approved by the Study Programmes Board and presented in a supplement to the programme syllabus.

7.2 Other degrees possible on the programme

The courses included in the Biology with specialisation in biotechnology - Bachelor's programme also allow for the awarding of the following degree, provided that the specified requirements are fulfilled:

- Degree of Bachelor with biology as the main field.

8. Miscellaneous

8.1 Credit transfer

Credits for courses from another higher education institution, in Sweden or abroad, may be transferred and recognised in the degree. Credits may be deducted if there is significant overlap between the courses passed at SLU and the external courses the student wishes to include in the degree. Credit transfer cannot be done if there is a considerable difference between the courses.

Credit transfer requests are considered on an individual basis. Once transfer has been approved, equivalent knowledge and skills acquired professionally may also be recognised.

8.2 Provisional regulations

Students admitted to other study programmes at the Swedish University of Agricultural Sciences before 1 July 2007 may receive a Degree of Bachelor if the requirements according to Item 7. Examination are fulfilled. If such a student fulfils the requirements according to the set study plan for the Bachelor's Programme in Biology with specialisation in biotechnology, this shall be shown on the degree certificate.