



Programme syllabus

Master's Programme, Medical Biotechnology, 120 credits

Masterprogram, medicinsk bioteknologi

120.0 credits

Valid for students admitted to the education from autumn 18 (HT - Autumn term; VT - Spring term).

This is a translation of the Swedish, legally binding, programme syllabus.

Programme objectives

Knowledge and understanding

After completing the Medical Biotechnology programme the students should:

- demonstrate broad knowledge and understanding of biotechnology as well as have deep knowledge and understanding of subject specific areas.
- demonstrate knowledge and understanding of current research and development in the field of biotechnology.
- demonstrate deep knowledge of methods used in biotechnology.
- be able to exchange information and communicate with experts in subjects related to biotechnology, such as biology, chemistry, mathematics, medicine and physics.

Skills and abilities

After completing the Medical Biotechnology programme the students should have:

- critically and systematically integrate knowledge and be able to analyze, judge and handle complex phenomena, questions and situations even with limited information.
- critically, independently and creatively identify and formulate questions and problems.
- be able to plan and execute complex tasks with adequate methods within given time frames and thereby contribute to the knowledge development, including evaluation of the results.
- communicate knowledge in writing and verbally as well as discuss conclusions and supporting arguments in national and international context for different audiences.
- demonstrate a capacity to work with research and development or to independently work with sophisticated activities.

Ability to make judgements and adopt a standpoint

After completing the Medical Biotechnology programme the students should:

- critically evaluate relevant scientific, societal and ethical aspects on questions and problems within biotechnology and consider ethical aspects of research and development.
- recognize possibilities and limitations of science and its role in society.
- show an understanding of how scientific methods, products and processes can be used in a responsible manner.
- be able to identify the need for additional knowledge and be responsible for his/her own knowledge development.

For more information see “Local regulation for degrees at first and second cycle, local system of qualifications” at www.kth.se

Extent and content of the programme

Medical Biotechnology is a two-year (120 credits) master programme, second cycle. The language of instruction is English.

Eligibility and selection

A completed Bachelor's degree - corresponding to a Swedish Bachelor's degree (180 credits), or equivalent academic qualifications from an internationally recognized university.

For more information regarding general admission requirements, see; "Study at KTH/master's programmes /entry requirements" at www.kth.se

Specific admission requirements

In addition to the general admission requirement, the programme requires:

- Courses in cell biology, biochemistry, microbiology and gene technology/molecular biology corresponding to a total of at least 20 credits
- Courses in chemistry corresponding to at least 30 credits
- Courses in mathematics, numerical analysis and computer science to a total of at least 20 credits.
- English proficiency corresponding to "Engelska B" in Swedish secondary school.

English proficiency is most commonly established through an internationally recognized test.

For more information on how to show English proficiency, see; "Study at KTH/master's programmes, /admission requirements" at www.kth.se

Selection process

The selection process is based on the following selection criteria: University, previous studies (for instance GPA, grades in specific subjects and English), motivation for the studies (for instance letter of motivation, references, thesis proposal and relevant work experience). The evaluation scale is 1-75.

KTH's general admission regulation (in Swedish) see; www.kth.se

Implementation of the education

Structure of the education

The programme runs for two academic years with two semesters each year. Each academic year consists of 40 weeks, divided into four study periods, where one or more courses are simultaneously studied. The nominal study pace is 60 credits each academic year. For details about the structure of the academic year see; "Student at KTH/timetable" at www.kth.se

The master program in Medical Biotechnology offers second cycle courses in five subject areas. Students must complete all courses within one of the major subject areas: medical applications of biotechnology or omics. In addition, courses from any of the five subject areas medical applications of biotechnology, omics, cell-based process biotechnology, enzyme biotechnology or environmental biotechnology, will be selected. Students are recommended to take all courses within two of the subject areas. Students may choose to study other courses of relevance for their future profession. There is an ongoing update of the master program and minor changes to the curriculum may occur.

Courses

The programme is course-based. Lists of courses are included in [appendix 1](#).

Courses are organised to follow academic progression within in each subject area and students are recommended to follow the suggested outline. If other combinations of courses are studied it is important to check the prerequisites for each course. Courses belonging to each subject area are listed in appendix 1. The courses are under revision and there may be minor deviations from this list during the two study years.

Graduation from the program requires at least 105 higher education credits in biotechnology. Students must complete all courses within the major subject areas medical applications of biotechnology or omics. Optional courses relevant for the future profession as a master of science in biotechnology, are chosen freely by the student if they fulfil the program scope.

Teaching and examination methods vary between courses. Commonly, the concepts and theory of a subject is taught through lectures. Exercises, seminars and laboratory sessions aim to emphasize and deepen the understanding of the most important aspects of a subject.

Grading system

Courses in the first and the second cycle are graded on a scale from A to F. A-E are passing grades, A is the highest grade. The grades pass (P) and fail (F) are used for courses under certain circumstances.

Conditions for participation in the programme

Students accepted to the programme will start their studies in the end of August. To register, the student must be present in person at the programme start.

Participation requires admission to courses within the programme and course registration. Course registration is done via the personal menu at www.kth.se

Course selections for upcoming semesters are done no later than November 15 and May 15 each academic year.

For students starting their education from the autumn semester 2018, previous promotion requirements have been replaced with special admission requirements to each course. Admission requirements are specified in the course syllabus.

Recognition of previous academic studies

The students have the right to transfer credits from previous studies at universities in or outside of Sweden. The courses must be on a level and have content that complies with the program's educational goals. Transfer of credits is decided by the program director.

KTH's guideline for the crediting of university education can be found in the KTH Regulations at www.kth.se.

Studies abroad

Studies abroad are generally allowed on internationally recognized universities. The university and course selection must be approved by the programme director prior to the start of studies abroad. For more information, contact the international coordinator at the School of Biotechnology.

Degree project

Students admitted to the programme are required to perform an individual study in the form of a degree project corresponding to 30 credits.

The degree project is the final part of the education. The project work may begin when special admission requirements for the course are fulfilled.

The purpose of the degree project is for the student to demonstrate the ability to perform an independent project, using skills obtained during the courses in the programme. It is the student's responsibility to find a suitable degree project, with assistance from KTH.

The thesis will be conducted within major subject areas of Biotechnology. Degree projects in related fields have to be approved by the Director of Undergraduate studies at the School of Biotechnology. For more information, contact the School of Biotechnology student office.

Information regarding the grading scale and criteria of the degree project work read the course syllabus.

Degree

The Master of Science in biotechnology degree is obtained after completion of the Medical Biotechnology programme. The requirements are:

Approved final grade in all courses within at least one of the major subject areas: medical applications of biotechnology or omics.

Passed second cycle courses selected from at least two of the subject areas: medical applications of

biotechnology, omics, cell-based process biotechnology, enzyme biotechnology and environmental biotechnology, encompassing at least 105 credits.

Passed courses within the programme description comprising a total of no less than 120 credits.

The programme is designed so that students, when they graduate, have fulfilled Swedish national requirements for a Master degree.

Students must apply for the degree through the web service by logging into "Personal menu" applications for degrees. For further information visit www.kth.se

Degree of Master of science in Biotechnology (120 credits)
Teknologie masterexamen i Bioteknik

[Appendix 1 - Course list](#)

[Appendix 2 - Programme syllabus descriptions](#)



Appendix 1: Course list

Master's Programme, Medical Biotechnology, 120 credits (TMBIM),
Programme syllabus for studies starting in autumn 2018

Programme syllabus

Established Programme syllabus as PDF:

- [Valid for studies starting in autumn 2018](#)

General courses

Year 1

Mandatory courses (30.0 Credits)

Course code	Course name	Credits	Edu. level
BB2165	Biomolecular Structure and Function Medical applications, Omics	7.5 hp	Second cycle
BB2255	Applied Gene Technology Medical applications, Omics	7.5 hp	Second cycle
BB2441	Bioinformatics Medical applications, Omics	7.5 hp	Second cycle
BB2475	Genetics1 Medical applications, Omics	7.5 hp	Second cycle

Conditionally elective courses

Course code	Course name	Credits	Edu. level
BB2290	Molecular Biomedicine Medical applications	7.5 hp	Second cycle
BB2446	Immunology Medical applications	7.5 hp	Second cycle

BB2510	Proteomics Omics	6.0 hp	Second cycle
BB2560	Advanced Microbiology and Metagenomics Omics	7.5 hp	Second cycle

Recommended courses

Course code	Course name	Credits	Edu. level
BB1000	Programming in Python Recommended for students lacking prior courses in programming	7.5 hp	First cycle
BB1030	Microbiology Mandatory for students from programme CTKEM at KTH	9.0 hp	First cycle
BB1160	Eucaryotic Cell Biology Mandatory for students lacking prior courses in cellular biology	7.5 hp	First cycle
BB1180	Engineering Skills 2 Mandatory for students lacking project management and sustainability courses	1.5 hp	First cycle
BB2015	Environmental Toxicology Environmental Biotechnology	7.5 hp	Second cycle
BB2425	Glycobiotechnology Enzyme Biotechnology	7.5 hp	Second cycle
BB2450	The Cell Factory Cell-based Process Biotechnology	7.5 hp	Second cycle
BB2460	Biocatalysis Enzyme Biotechnology	7.5 hp	Second cycle

Supplementary information

The student should take courses within on of the following subjects areas: medical applications of biotechnology or omics.

Courses can also be selected from the subject areas cell-based process biotechnology, enzyme biotechnology and environmental biotechnology. In addition, elective courses can be selected.

Year 2

Mandatory courses (48.0 Credits)

Course code	Course name	Credits	Edu. level
AK2030	Theory and Methodology of Science (Natural and Technological Science)	4.5 hp	Second cycle
BB200X	Degree Project in Biotechnology, Second Cycle	30.0 hp	Second cycle
CB2020	Clinical applications of biotechnology	7.5 hp	Second cycle

Track, Medical Applications of Biotechnology (MABT)

Year 2

Mandatory courses (7.5 Credits)

Course code	Course name	Credits	Edu. level
CB2090	Drug Development	7.5 hp	Second cycle

Track, Omics (OMIC)

Year 2

Mandatory courses (7.5 Credits)

Course code	Course name	Credits	Edu. level
CB2030	Systems biology	7.5 hp	Second cycle



Appendix 2: Specialisations

Master's Programme, Medical Biotechnology, 120 credits (TMBIM),
Programme syllabus for studies starting in autumn 2018

Programme syllabus

Established Programme syllabus as PDF:

- [Valid for studies starting in autumn 2018](#)

Track, Medical Applications of Biotechnology (MABT)

Track, Omics (OMIC)