



Programme syllabus

Master's Programme, Medical Biotechnology, 120 credits

Masterprogram, medicinsk bioteknologi

120.0 credits

Valid for students admitted to the education from autumn 11 (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:

- have knowledge and skills in biotechnology and chemistry with an emphasis on medical applications.
- be able to grasp information and communicate with experts within neighbouring subjects to biotechnology and chemistry, such as physics, biology and medicine.
- have knowledge about biological and chemical processes on a molecular-, cellular-, and organism level.
- have a deep understanding of current research and development in one area of medical biotechnology.
- have some knowledge about the biotechnological industry in Sweden and in other countries.

Skills and abilities

After completing the *Medical Biotechnology* programme the students should have:

- a capacity to critically read and extract information of technical and scientific nature from various sources.
- a capacity to analytically and critically plan, execute and evaluate experiments.

- skills in the use of standard and advanced biotechnological methods and techniques on a level appropriate for continued studies as a doctoral student.
- skills in oral and written technical communication with both experts and non-experts of biotechnology and chemistry.

Ability to make judgements and adopt a standpoint

After completing the *Medical Biotechnology* programme the students should be able to:

- critically evaluate existing and new technological advancements in biotechnology and apply them to develop improved or novel commodities for society.
- use biotechnological methods, products and processes in a responsible manner.
- understand the impact of biotechnological developments on a social, ethical and gender level.
- understand the implications of biotechnological developments in the context of a sustainable society.

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

http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/examina/1.27227?l=en_UK

Extent and content of the programme

Medical biotechnology is a two-year (120 higher education credits) master programme on the advanced level (second cycle). The instruction language is entirely English. The programme consists of courses given by KTH, mainly by the School of Biotechnology.

Eligibility and selection

General admission requirements

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

Language requirements – applicants must proof their proficiency in English, which is most commonly established through an internationally recognized test.

Documentation – for detailed information about list of required documents, see “Admission requirements and selection” http://www.kth.se/en/studies/programmes/master/admission?l=en_UK

Specific admission requirements

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

- Courses in *cellbiology, biochemistry, microbiology and gene technology/molecular biology* with a total of at least 20 higher education credits

- Courses in *chemistry* of at least 30 higher education credits
- Basic knowledge in *mathematics, numerical analysis and computer science* with a total of at least 20 higher education credits.

For more information, see Study at KTH, Master's programmes at KTH, "Admission requirements".

http://www.kth.se/en/studies/programmes/master/programmes/biotechnology/industrialbio/industrial-and-environmental-biotechnology-application-and-admission-for-external-applicants-1.48684?l=en_UK

Selection process

The selection process for the *Medical biotechnology* programme is based on a total evaluation of the following criteria: university, grade point average (GPA), courses relevant to the programme, motivation letter, relevant work experience, references and English proficiency.

Complete information on the eligibility requirements can be found in the local admission policy of KTH, see:

http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/antagning/antagning-till-master-och-magisterprogram-pa-avancerad-niva-med-undervisning-pa-engelska-1.27192?l=en_UK

Implementation of the education

Structure of the education

The academic year at KTH consists of 40 weeks, divided into four study periods, where two or three courses are simultaneously studied. The nominal study pace is 60 higher education credits each academic year.

The mandatory courses comprise 38 higher education credits during the first academic year and 49.5 higher education credits (of which the degree project, second level is 30 higher education credits) during the second academic year. The list of courses in appendix 1 contains a group of recommended courses from which the students must choose at least 17.5 higher education credits. The last higher education credits to reach 120 can be freely chosen by the student.

Courses

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

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. The programme is concluded with a degree project, advanced level of 30 higher education credits. To receive the degree "*Master of Science (120 credits)*", the students should have passing grades in all the mandatory and optional courses, which including the thesis will comprise 120 higher education credits.

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 the programme in the end of August when the registration also takes place and where the student must be present in person. The students are thereafter required to make a study registration and course selection for the coming term no later than November 15 and May 15 each academic year, respectively. At least 45 higher education credits have to be completed during the first academic year (including the re-examination period in August) in order for the student to be promoted to the second year of the programme.

Students who have not passed 45 credits in the first year must contact the programme coordinator for an individual study plan, otherwise the student will not be registered on any courses in the upcoming academic year. This study plan will include residual courses and appropriate courses for the upcoming year.

Recognition of previous academic studies

The students have the right to transfer higher education credits from previous studies at universities in or outside of Sweden. The courses have to be at a level and include contents that agree with the goals of the programme. Transfer of higher education credits are decided by the program director.

For more information see:

http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/prestationer/policy-for-tillgodoraknande-av-hogskoleutbildning-inklusive-bedomning-av-reell-kompetens-1.27200?l=en_UK

Studies abroad

For information about studies abroad, 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 main portion of the studies must be completed before the start of the degree project. This means that at least 60 credits (of which 30 must be in the second cycle within the main field of study) have to be completed before the start of the degree project.

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 thesis project, with assistance from KTH.

The degree project should normally be performed in the field of biotechnology. Degree projects in related fields may also be allowed, but need approval by the Director of Undergraduate and Masters' studies at the School of Biotechnology.

For more information, contact the study advisor at the BIO students office.

Grading of the degree project is done by a seven step goal-related grading system (A to F), where A-E are passing grades and A is the highest. The grade is based on three evaluation criteria:

- the process of planning and performing the degree project within the given timeframe.
- the use of engineering approach and skills when performing the degree project.
- the oral and written presentation of the degree project.

More information on the KTH policy on the degree project can be found at:

<http://intra.kth.se/en/regelverk/utbildning-forskning/grundutbildning/examensarbete/overgripande-regler-och-riktlinjer-for-examensarbete-30-hogskolepoang-for-masterexamen-120-hogskolepoang-samt-betygsattning-av-examensarbete-1.27212>

Degree

Master of Science (120 credits) - is obtained after completion of the Medical Biotechnology programme. The programme is designed so that students, when they graduate, have fulfilled Swedish national requirements for a degree and have completed courses comprising 120 higher education credits, of which:

- at least 90 higher education credits are at second cycle, of which at least 60 higher education credits (including the 30 higher education credit degree project) are in-depth studies in the main field of the programme.

Students must apply for the degree at the student office and are required to show proof of their basic degree (Bachelor or similar).

Degree name

Master of Science (120 credits)

Teknologie masterexamen

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

http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/examina/1.27227?l=en_UK

[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 2011

General courses

Year 1

Mandatory courses (38.0 Credits)

Course code	Course name	Credits	Edu. level
AK2036	Theory and Methodology of Science with Applications (Natural and Technological Science)	7.5 hp	Second cycle
BB2160	Structure Biology	7.5 hp	Second cycle
BB2440	Bioinformatics and Biostatistics	7.0 hp	Second cycle
BB2470	Genetics and Genomics	10.0 hp	Second cycle
ME1000	Industrial Management	6.0 hp	First cycle

Recommended courses

Course code	Course name	Credits	Edu. level
BB1130	Analysis and Purification of Biomolecules	7.0 hp	First cycle
BB2020	Molecular Enzymology	7.5 hp	Second cycle
BB2280	Molecular Modeling	7.5 hp	Second cycle
BB2330	Plant Biotechnology	7.5 hp	Second cycle
BB2460	Biocatalysis	7.5 hp	Second cycle
BB2490	Analysis of Data from High-throughput Molecular Biology Experiments	7.5 hp	Second cycle
BB2530	Micro and Nanotechnologies for Biotechnology	6.0 hp	Second cycle
DD2397	Applied Bioinformatics	7.5 hp	Second cycle
KD2320	Spectroscopic Tools for Chemistry	9.0 hp	Second cycle
KD2410	Imaging Tools of Chemistry	6.0 hp	Second cycle
ME2806	From Science to Business	7.5 hp	Second cycle

[MJ2613](#) [Sustainable Development](#)

6.0 hp Second cycle

Supplementary information

Study year 1 consists of mandatory courses and recommended courses.

Year 2

Mandatory courses (49.5 Credits)

Course code	Course name	Credits	Edu. level
BB201X	Degree Project in Biotechnology, Second Cycle	30.0 hp	Second cycle
BB2170	Drug Development	6.0 hp	Second cycle
BB2290	Molecular Biomedicine	7.5 hp	Second cycle
BB2510	Proteomics	6.0 hp	Second cycle

Optional courses

Course code	Course name	Credits	Edu. level
BB2020	Molecular Enzymology	7.5 hp	Second cycle
BB2280	Molecular Modeling	7.5 hp	Second cycle
KD2320	Spectroscopic Tools for Chemistry	9.0 hp	Second cycle
KD2410	Imaging Tools of Chemistry	6.0 hp	Second cycle
MJ2613	Sustainable Development	6.0 hp	Second cycle

Recommended courses

Course code	Course name	Credits	Edu. level
AK2008	Ethics of Biotechnology	7.5 hp	Second cycle
BB2010	Environmental Toxicology	9.0 hp	Second cycle
BB2420	Glycobiology and Carbohydrate Technology	7.5 hp	Second cycle
ME2016	Project Management: Leadership and Control	6.0 hp	Second cycle

Supplementary information

Study year 2 consists of mandatory courses and recommended courses, and ends with a degree project, second level, 30 credits.



Appendix 2: Specialisations

Master's Programme, Medical Biotechnology, 120 credits (TMBIM),
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This programme has no specialisations.