



Programme syllabus

[An accessible version of the syllabus can be found in the Course and programme directory.](#)

Master's Programme, Macromolecular Materials 120 credits

Masterprogram, makromolekylära material

Valid for students admitted to the education from autumn 10 (HT - Autumn term; VT - Spring term).

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

Programme objectives

Knowledge and understanding

To receive a Degree of Master of Science in **Macromolecular materials**, the students should:

- demonstrate a general knowledge about properties and use of different materials.
- demonstrate in-depth knowledge about relations between materials structure and properties, about different techniques for materials characterization and about synthesis and design of macromolecular materials.

- have insight into current research and development in material chemistry.

Skills and abilities

To receive a Degree of Master of Science in *Macromolecular materials*, the students should:

- demonstrate the ability to identify, formulate and manage current and real materials related problems drawn from industry, society and research, taking into account the potential and limitations.
- demonstrate the ability to make assessment of the reasonableness of the obtained solutions, and compare and evaluate alternative solutions.
- demonstrate laboratory skills and knowledge of safe chemical managing, and the ability to implement and evaluate materials related experiments on a laboratory scale.
- demonstrate the ability to orally and in writing present and discuss ideas and outcomes.

Ability to make judgements and adopt a standpoint

To receive a Degree of Master of Science in *Macromolecular materials*, the students should:

- demonstrate the ability to critically review the literature and technologies in areas related materials chemistry.
- demonstrate the ability to take a stand on issues of ethical nature in their professional field.
- demonstrate an understanding for the fact that materials related problems can be complex, incompletely defined and contain contradictory conditions.
- demonstrate the ability to rapidly acquire knowledge in new areas and to apply new knowledge for innovation and development of materials and related processes.

Extent and content of the programme

Macromolecular Materials 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 Chemical Science and Engineering.

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.

For more information, see http://www.kth.se/studies/master/admission?l=en_UK

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

For more information, see

http://www.kth.se/studies/master/admission?l=en_UK

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

Specific admission requirements

In order to be admitted to the **Macromolecular Materials** programme, a Bachelor's degree in Chemistry or closely related subject, of 180 higher education credits, including the following is required:

- Courses in chemistry or closely related subject for at least 75 higher education credits.
- Basic knowledge in mathematics for at least 20 higher education credits.
- Basic knowledge in numerical analysis/computer science for at least 9 higher education credits.

For more information, see Study at KTH, Master's programmes at KTH, “Admission requirements”. http://www.kth.se/studies/master/admission?l=en_UK

Selection process

The selection process for the **Macromolecular Materials** programmes based on a total evaluation of the following selection criteria: university, grade point average (GPA), course work related to the programme, motivation letter and 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/1.27192>

Implementation of the education

Structure of the education

The academic year has a duration of 40 weeks. The academic year at KTH is divided into four periods. Each period lasts approximately seven weeks and is followed by an examination period.

The programme consists of courses for 90 higher education credits courses followed by a degree project, advanced level of 30 higher education credits. Two mandatory courses (15 higher education credits) are included in the first year, and remaining courses may be chosen from a list of 25 courses. Within this list 5 courses are regarded as particularly important, and the student is required to choose

at least 3 of these 5. This gives the student a great opportunity to create his/her own curriculum. Guidelines and recommendations for course combinations will be given. Courses corresponding to 15 higher education credits can be elected freely.

Courses

The programme is course-based. Lists of courses are included in appendix 1.

The programme consists of mandatory, conditionally elective, recommended and elective courses. The goals, prerequisites, contents and examination requirements of different courses can be found in the respective course plans.

Two or three courses are usually studied in parallel during each period. Teaching and examination methods vary between the courses. Normally the course contains lectures, which give an introduction to the concepts and theory. Exercises, seminars, laboratory work and project assignments deepen the conceptual understanding, give practical experience and give possibility to practice the group skills.

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

The students are 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 educational coordinator for an individual study plan. This study plan will include residual courses and appropriate courses for the upcoming year. The student who has not done this will not be registered on any courses in the upcoming academic year.

Recognition of previous academic studies

Under certain circumstances, and in agreement with the programme director, credits for previous studies can be received according to the local policy of KTH, see <http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/prestationer/1.27200>

Studies abroad

For information about studies abroad, contact the international coordinator at the School of Chemical Science and Engineering

Degree project

Students admitted to the programme are required to perform an individual study in the form of a degree project, advanced level, corresponding to 30 credits. This means 20 weeks of fulltime studies. The main portion of the studies must generally be completed before the degree project work can be started. At least 60 credits must be completed where 30 credits in the second cycle within the main field of study.

The purpose of the thesis project is that the student demonstrates the ability to perform independent project work, using the skills obtained from the courses in the programme. It is the student's responsibility to find a suitable thesis project, with assistance from KTH.

Degree project, advanced level for the Degree of Master of Science, Macromolecular Materials, can be performed in the following exam topics:

Fibre and Polymer Technology, Chemistry, Chemical engineering.

Other degree projects in related fields may also be allowed, but need approval by the Director of Undergraduate and Masters' studies at the School of Chemical Science and Engineering. For more information, contact the study advisor at the CHE students office.

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-betygssattning-av-examensarbete-1.27212>

Degree

Master of Science (120 credits) - is obtained after completion of the Master(Two Years), ***Macromolecular Materials*** study programme. The programme is designed so that students, when they graduate, have fulfilled 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 a 30- higher education credits degree project) with in-depth studies in the main field of study.

Students who fulfil all the requirements will be awarded a Master of Science (120 credits). Students must apply for the degree and also show proof of their basic degree (Bachelor or similar) and have paid the student union fee.

Degree name
Master of Science (120 credits)
Teknologie masterexamen

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, Macromolecular Materials (TMMMM)

General courses

Year 1

Mandatory courses (22.5 Credits)

Code	Name	Credits	Edu. level
AK2036	Theory and Methodology of Science with Applications (Natural and Technological Science)	7.5 hp	Second cycle
KD1090	Organic Chemistry 1	7.5 hp	First cycle
KF2110	Mechanical Properties of Materials	7.5 hp	Second cycle

Conditionally elective courses

Code	Name	Credits	Edu. level
KD2150	Inorganic Materials Chemistry	7.5 hp	Second cycle
KF2130	Polymer Chemistry	7.5 hp	Second cycle
KF2140	Polymer Physics	7.5 hp	Second cycle
KF2450	Fibre Technology - Natural and Synthetic Fibres	7.5 hp	Second cycle
KF2460	Bio Fibre Chemistry	7.5 hp	Second cycle

Recommended courses

Code	Name	Credits	Edu. level
BB2020	Molecular Enzymology	7.5 hp	Second cycle
BB2420	Glycobiology and Carbohydrate Technology	7.5 hp	Second cycle
BB2460	Biocatalysis	7.5 hp	Second cycle
KA2010	Academic Transition at Master Level	1.0 hp	Second cycle
KD2310	Advanced Organic Chemistry	7.5 hp	Second cycle
KD2320	Spectroscopic Tools for Chemistry	9.0 hp	Second cycle
KD2350	Surfaces, Colloids and Soft Matter	7.5 hp	Second cycle
KE2310	Sustainable Systems for Heat, Power and Materials Production	7.5 hp	Second cycle
KF2180	Biopolymers	7.5 hp	Second cycle
KF2190	Polymeric Materials: Structure and Properties	7.5 hp	Second cycle
KF2470	Pulp and Paper Processes	7.5 hp	Second cycle
KF2480	Chemistry of a Biorefinery	7.5 hp	Second cycle
KF2490	Biocomposite Materials	7.5 hp	Second cycle
ME2800	Ideation - Creating a Business Idea	7.5 hp	Second cycle

Supplementary information

Study year 1 consists of two mandatory courses, at least three of the conditionally elective courses and recommended courses.

The courses KF2110 and AK2036 are mandatory courses for all students admitted to the program, except students admitted to program with a background at the Degree Programme in Materials Design and Engineering (CMATD), which instead must follow the courses: KD1090 and AK2036.

Year 2

Conditionally elective courses

Code	Name	Credits	Edu. level
KF201X	Degree Project in Wood Chemistry, Second Cycle	30.0 hp	Second cycle
KF202X	Degree Project in Paper Technology, Second Cycle	30.0 hp	Second cycle
KF203X	Degree Project in Fiber Technology, Second Cycle	30.0 hp	Second cycle
KF204X	Degree Project in Pulp Technology, Second Cycle	30.0 hp	Second cycle
KF205X	Degree Project in Polymer Technology, Second Cycle	30.0 hp	Second cycle
KF206X	Degree Project in Polymeric Materials, Second Cycle	30.0 hp	Second cycle
KF207X	Degree Project in Surface Coating Technology, Second Cycle	30.0 hp	Second cycle
KF211X	Degree Project in Biocomposites, Second Cycle	30.0 hp	Second cycle

Recommended courses

Code	Name	Credits	Edu. level
KD2170	Nano-structured Materials	7.5 hp	Second cycle
KD2300	Biomedical Materials	7.5 hp	Second cycle
KD2320	Spectroscopic Tools for Chemistry	9.0 hp	Second cycle
KD2380	Corrosion and Surface Protection	7.5 hp	Second cycle
KE2310	Sustainable Systems for Heat, Power and Materials Production	7.5 hp	Second cycle
KF2150	Surface Coatings Chemistry	7.5 hp	Second cycle
KF2470	Pulp and Paper Processes	7.5 hp	Second cycle
KF2500	Polymer Engineering	9.0 hp	Second cycle
KF2510	Advanced Pulp and Paper Processes	7.5 hp	Second cycle
KF2520	Design of Products in Materials Chemistry	7.5 hp	Second cycle

Supplementary information

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

Under the title "Conditionally Elective" the Degree Projects is listed.

One of the Degree Projects have to be chosen.



Appendix 2: Specialisations

Master's Programme, Macromolecular Materials (TMMMM)

This programme has no specialisations.