Utbildningsplan

Masterprogram, makromolekylära material
Master's Programme, Macromolecular Materials, 120 credits
120,0 högskolepoäng

Gäller för antagna till utbildningen fr o m HT11.

Utbildningens mål

Kunskap och förståelse

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.

Färdigheter och förmågor

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.

Värderingsförmåga och förhållningssätt

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 contradictoryconditions.
- demonstrate the ability to rapidly acquire knowledge in new areas and to apply new knowledge for innovation and development of materials and related processes.

Utbildningens omfattning och innehåll

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.

Behörighet och urval

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 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/en/studies/programmes/master/programmes/chemicalscience/molecularscience
/molecular-science-and-engineering-application-and-admission-for-external-applicants-1.48527?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/antagning-till-master-och-magisterprogram-pa-avancerad-niva-med-undervisning-pa-engelska-1.27192?l=en_UK

Utbildningens genomförande

Utbildningens upplägg

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.

Kurser

Utbildningen sker i kursform. Kurslistor finns i bilaga 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.

Betygssystem

För kurser på KTH används en sjugradig målrelaterad betygsskala A-F som slutbetyg för kurser på grundnivå och avancerad nivå. A-E är godkända betyg med A som högsta betyg. Betygen godkänd (P) och underkänd (F) används som slutbetyg då särskilda skäl föreligger.

Villkor för deltagande i utbildningen

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 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.

Tillgodoräknanden

Under certain circumstances, and in agreement with the programme director, credits for previous studies can be received according to the local policy of KTH.

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

Utlandsstudier

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

Examensarbete

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

Examen

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).

Degree name
Master of Science (120 credits)
Teknologie masterexamen

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

Bilaga 1 - Kurslista
Bilaga 2 - Inriktningsbeskrivningar

Bilaga 1: Kurslista

Utbildningsplan kull HT2011, Masterprogram, makromolekylära material (TMMMM)

Gemensamma kurser

Årskurs 1

Obligatoriska kurser (22,5 Högskolepoäng)

Kurskod	Namn	Omfattning	Utbildningsnivå
AK2036	Vetenskapsteori och vetenskaplig metodik med tillämpningar (naturvetenskap)	7,5 hp	Avancerad nivå
KD1090	Organisk kemi 1 *Läses av studenter med programbakgrund Materialdesign (CMATD)*	7,5 hp	Grundnivå
KF2110	Materials mekaniska egenskaper *Läses ej av studerande med programbakgrund Materialdesign (CMATD)*	7,5 hp	Avancerad nivå

Villkorligt valfria kurser

Kurskod	Namn	Omfattning	Utbildningsnivå
KD2150	Oorganisk materialkemi	7,5 hp	Avancerad nivå
KF2130	Polymerkemi	7,5 hp	Avancerad nivå
KF2140	Polymerfysik	7,5 hp	Avancerad nivå
KF2450	Fiberteknologi - Naturliga och syntetiska fibrer	7,5 hp	Avancerad nivå
KF2460	Biofibrernas kemi	7,5 hp	Avancerad nivå

Rekommenderade kurser

Kurskod	Namn	Omfattning	Utbildningsnivå
BB2020	Molekylär enzymologi	7,5 hp	Avancerad nivå
BB2420	Glykobiologi och kolhydratsteknologi	7,5 hp	Avancerad nivå
BB2460	Biokatalys	7,5 hp	Avancerad nivå
KD2310	Organisk kemi, fortsättningskurs	7,5 hp	Avancerad nivå
KD2350	Ytor, kolloider och mjuka material	7,5 hp	Avancerad nivå

KF2180	Biopolymerer	7,5 hp	Avancerad nivå
KF2190	Polymera material: Struktur och egenskaper	7,5 hp	Avancerad nivå
KF2480	Bioraffinaderiets kemi	7,5 hp	Avancerad nivå
KF2490	Biokompositer	7,5 hp	Avancerad nivå
ME2800	Ideation - Creating a Business Idea	7,5 hp	Avancerad nivå

Kompletterande information

I årskurs 1 läses två obligatoriska kurser samt minst tre av de villkorligt valfria kurserna samt rekommenderade kurser.

Kurserna KF2110 och AK2036 är obligatoriska kurser för alla studerande på pogrammet, med undantag för de som är antagna med programbakgrund Materialdesign (CMATD), som istället läser följande två obligatoriska kurser: KD1090 och AK2036.

Årskurs 2

Obligatoriska kurser (240,0 Högskolepoäng)

Kurskod	Namn	Omfattning	Utbildningsnivå
KF201X	Examensarbete inom träkemi, avancerad nivå	30,0 hp	Avancerad nivå
KF202X	Examensarbete inom pappersteknik, avancerad nivå	30,0 hp	Avancerad nivå
KF203X	Examensarbete inom fiberteknologi, avancerad nivå	30,0 hp	Avancerad nivå
KF204X	Examensarbete inom massateknologi, avancerad nivå	30,0 hp	Avancerad nivå
KF205X	Examensarbete inom polymerteknologi, avancerad nivå	30,0 hp	Avancerad nivå
KF206X	Examensarbete inom polymera material, avancerad nivå	30,0 hp	Avancerad nivå
KF207X	Examensarbete inom ytbehandlingsteknik, avancerad nivå	30,0 hp	Avancerad nivå
KF211X	Examensarbete inom biokompositer, avancerad nivå	30,0 hp	Avancerad nivå

Valfria kurser

Kurskod	Namn	Omfattning	Utbildningsnivå
BB2020	Molekylär enzymologi	7,5 hp	Avancerad nivå
BB2420	Glykobiologi och kolhydratsteknologi	7,5 hp	Avancerad nivå
KD2310	Organisk kemi, fortsättningskurs	7,5 hp	Avancerad nivå
KD2320	Spektroskopiska verktyg inom kemi	9,0 hp	Avancerad nivå
KD2350	Ytor, kolloider och mjuka material	7,5 hp	Avancerad nivå
KE2310	Hållbara system för värme-, el- och materialproduktion	7,5 hp	Avancerad nivå

Rekommenderade kurser

Kurskod	Namn	Omfattning	Utbildningsnivå
KD2170	Nanostrukturerade material	7,5 hp	Avancerad nivå
KD2300	Biomedical Materials	7,5 hp	Avancerad nivå

KD2380	Korrosion och ytskydd	7,5 hp	Avancerad nivå
KF2150	Ytbehandlingskemi	7,5 hp	Avancerad nivå
KF2470	Massa- och pappersprocesser	7,5 hp	Avancerad nivå
KF2500	Polymerteknologi	9,0 hp	Avancerad nivå
KF2510	Massa- och pappersprocesser, fördjupningskurs	7,5 hp	Avancerad nivå
KF2520	Design av produkter inom materialkemin	7,5 hp	Avancerad nivå

Kompletterande information

I årskurs 2 läses rekommendera kurser samt ett obligatoriskt examensarbete, avancerad nivå 30 hp.
(Se lista över examensarbeten nedan)

Bilaga 2: Inriktningar

Utbildningsplan kull HT2011, Masterprogram, makromolekylära material (TMMMM)

Programmet har inga inriktningar.