



Programme syllabus

Master's Programme, Sports Technology

Masterprogram, idrottsteknologi

120.0 credits

Valid for students admitted to the education from autumn 19 (HT - Autumn term; VT - Spring term).

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

Programme objectives

Technically, the program focuses on measurement, simulation, and motion and performance analysis. The program also includes a block focusing on entrepreneurship, innovation and design. These blocks are complemented by a block of Sports Science, which is read at GiH.

The program includes both "traditional" engineering courses in electrical engineering and mechanics to provide technical skills and a course in physiology to provide the medical/scientific breadth. The interdisciplinary nature of the program ensures skills in cooperation and dialogue with different groups as well as the ability to handle social, economic and environmental issues.

Through project work, opportunities are offered to develop knowledge in formulating objectives and questions, seeking scientific literature and training presenting their work both verbally and in writing.

Upon completion of the program, the student should be able to influence and conduct improvement and development work in the field of sports technology. The education provides a good foundation for research studies in the field of technology and health

Knowledge and understanding

Upon completion of program studies, students should have:

- deep knowledge in the health and technology field.
- knowledge of anatomy, physiology and medicine terminology as well as understanding of the different needs for technical solutions in sport
- knowledge about scientific tools for analysing, working on and valuing facts as well as understanding how knowledge evolves in natural science, technology and social science

Skills and abilities

Upon completion of program studies, students will acquire skills and abilities on an individual basis to:

- independently and in a group, put knowledge and abilities into practical action, with consideration to relevant scientific, professional and sociological judgments and opinions
- ability to identify, formulate, analyse and solve problems with regards to current circumstances (scientific, engineer-related, and social) based on ethical and professional standpoints
- skills in presentation and communication, especially regarding sports technology, such that good prerequisites for efficient work are achieved individually as well as in a multinational group

Ability to make judgements and adopt a standpoint

Upon completion of program studies, students should have:

- professional and ethical responsibility in scientific, technical, ecological and social activities.
- understanding that engineering-related problems, considered from a system perspective are often complex, can be incompletely defined and sometimes contain conflicting conditions
- awareness of how personal values and positions affect the definition and assessment of technical and medical problems
- a will to follow and use the development of knowledge in the field of sports technology

In addition to the above, the goals set out in the Higher Education Degree Ordinance regulations apply to general degrees at the master's and master's level.

Extent and content of the programme

The programme consists of 120 higher education credits which correspond to two years full time studies. The programme is mainly on the second level.

All the compulsory courses are on the second level, but some elective courses may be on the first level.

The language of instruction for the programme is mainly English. All compulsory courses are in English, but some elective and conditionally elective courses may be given in Swedish. It will however be possible to achieve a full degree using only courses in English.

Eligibility and selection

In order to be eligible to apply to the master's programme, a bachelor's degree in engineering or corresponding degree in the first level. The degree must contain courses in Mathematics, Mechanics, Computing and Electronics equivalent to at least 20 credits in Mathematics, 12 credits in Mechanics, 10 credits in Computing and 5 credits in Electronics.

Other studies or work experiences are judged on the basis of the actual competencies which are referred to.

The selection to the programme is based on the evaluation of the following criteria: university/higher education institute where the bachelor degree was given, courses relevant to the programme, personal letter with CV and motivation to the choice of programme and recommendation letters.

Implementation of the education

Structure of the education

The primary field of technology and health is interdisciplinary, combining knowledge and practitioners from different fields of science. The teaching in the program is based on the ability to convey knowledge of the understanding and development of new technologies that can be used both in measuring sports performance, in health and medical care. Due to the cross-disciplinary nature of the program, several schools contribute; Industrial Engineering and Management, Technology Science, and Chemistry, Biotechnology and Health at KTH, as well as the School of Gymnastics and Sport.

The program will be given in the form of full-time studies during the daytime. Admission must take place every autumn term. The majority of the courses will be given by and on KTH, but some courses will be combined with students from GIH, and the courses will be given there. The students from GIH are reading master programs there and enrolled in this program course code,

Through the project work and finally the degree project, the student will be able to integrate the acquired knowledge and experience from the main courses.

Courses

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

Year 1:

Semester 1:

MF2043 Robust mechatronics, 6 hp (p1)

SG2804 Biomechanics of Human Movement, 7 hp (p2)

HL2041 Sports Technology, 9 hp (p1 och p2) ***

XXxxxx Measurement technology for health and sports applications. 8 hp (p1 och p2) **

Semester 2

GiH Sport and Health science, 15 hp (p3 och p4) *

MF2103 Embedded Systems for Mechatronics, 9hp (p3)

XXxxxx Mobile applications and data analysis for sports, 6 hp (p4)

Year 2

Semester 3

XXxxxx Entrepreneurship in Technology and Helath, 7,5 hp (p1) ***

XXxxxx Performance analysis with machine learning, 7,5 hp (p1) **

XXxxxx Product design of sports technology, 7,5 hp (p2) ***

AK2036 Theory and Methodology of Science with, 7,5 hp (p2) ***

Semester 4

The spring term year two consists of a thesis of 30 credits. It can be done individually or in groups of two students.

HL207X Degree Project, 30 credits ***

* The course is given by GIH. KTH students study with GIH students.

** Completed to some extent with GIH students

*** Collaborated with GIH students

Conditional Choices:

2 of the following courses should be read:

MF2043 (Robust Mechatronics)
Mobile applications and data analysis for sports
Performance analysis with machine learning

And 1 of the courses:

Entrepreneurship in Technology and Health
Product design of sports technology

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

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

Some of the elective courses might have a limit in the number of participants. Selection will be based primarily by number of credits obtained within the programme, secondly by grades.

Special admission requirements to each course are specified in the course syllabus.

Between 1 and 15 of May the students apply for admission to courses for the upcoming autumn term, and between 1 and 15 of november for the upcoming spring term.

Recognition of previous academic studies

The student has the possibility to apply to receive credits from courses taken at another university/higher education institution both in Sweden and from abroad. The application form can be found on KTH's website.

Studies abroad

After approval by the programme director, part of the studies may be carried out abroad (including the Master's degree project). The condition is that the parts of the programme carried out abroad should fit in with the educational programme.

Degree project

A 30-credit Master's degree project is carried out at the end of the educational programme and 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 project is to let the student study a problem in more depth than is possible in the courses. The degree project can be carried out at an industrial company, a hospital or at an academic institution in Sweden or abroad.

Degree

In order to graduate with the Degree of Master of Science (Two Years) within the main area Technology and Health, a passing grade must be achieved in all courses which are in the student's study plan. The study plan must comprise 120 higher education credits including a degree project consisting of 30 higher education credits.

To receive the MSc degree, students must fill in an online application form.

[Appendix 1 - Course list](#)

[Appendix 2 - Programme syllabus descriptions](#)



Appendix 1: Course list

Programme syllabus for studies starting in autumn 2019, Master's Programme, Sports Technology (TIDTM)

General courses

Year 1

Mandatory courses (54.0 Credits)

Code	Name	Credits	Edu. level
CM2000	Health and Sports Instrumentation	8.0 hp	Second cycle
CM2001	Mobile Sports Applications and Data Mining	6.0 hp	Second cycle
CM2005	Sports and Exercise Physiology	15.0 hp	Second cycle
HL2041	Sports Technology	9.0 hp	Second cycle
MF2103	Embedded Systems for Mechatronics	9.0 hp	Second cycle
SG2804	Biomechanics of Human Movement	7.0 hp	Second cycle

Conditionally elective courses

Code	Name	Credits	Edu. level
MF2043	Robust Mechatronics	6.0 hp	Second cycle

Year 2

Mandatory courses (60.0 Credits)

Code	Name	Credits	Edu. level
AK2036	Theory and Methodology of Science with Applications (Natural and Technological Science)	7.5 hp	Second cycle
CH2007	Product Design in Ergonomics and Sports	7.5 hp	Second cycle
CM2007	Applied Machine Learning and Data Mining for Performance Analysis	7.5 hp	Second cycle
CM2008	Entrepreneurship in Technology and Health	7.5 hp	Second cycle



Appendix 2: Specialisations

Programme syllabus for studies starting in autumn 2019, Master's Programme, Sports Technology (TIDTM)

This programme has no specialisations.