Programme syllabus for

Joint Master's Programme in Health Informatics, 120 credits

Masterprogrammet i hälsoinformatik, 120 hp

Basic programme information

Programme code	5HI12
Name of the programme	Joint Master's Programme in Health Informatics
Number of credits	120.0 credits (120.0 ECTS credits)
Starting date	The syllabus applies to students who commence their studies in or after autumn 2012. Approved revisions of the syllabus are described under the heading Transitional Provisions.
Decision date	2011-09-07
Decided by	Board of Higher Education
Last revision	2025-03-04
Revised by	Committee for Higher Education
Reference number	3-1137/2025
Specific eligibility requirements	A Bachelor's degree or a professional degree equivalent to a Swedish Bachelor's degree of at least 180 credits in healthcare, biomedicine, medical technology, computer and systems sciences, informatics or the equivalent. And proficiency in English equivalent to English B/English 6.
Main field of study	Health Informatics
Qualification	Degree of Master of Medical Science (120 credits) with a major in Health Informatics. Upon request, a student who meets the requirements for a qualification is to receive a diploma.

Outcomes

Outcomes of second cycle education according to the Higher Education Act

Second-cycle courses and study programmes shall be based fundamentally on the knowledge acquired by students during first-cycle courses and study programmes, or its equivalent.

Second-cycle courses and study programmes shall involve the acquisition of specialist knowledge, competence and skills in relation to first-cycle courses and study programmes and in addition to the requirements for first-cycle courses and study programmes shall:

- further develop the ability of students to integrate and make autonomous use of their knowledge
- develop the students' ability to deal with complex phenomena, issues and situations, and
- develop the students' potential for professional activities that demand considerable autonomy, or for research and development work.

Outcomes of the Degree of Master (120 credits) according to the Higher Education Ordinance

Knowledge and understanding
For a Degree of Master the student shall

- demonstrate knowledge and understanding in the main field of study, including both broad knowledge of the field and a considerable degree of specialised knowledge in certain areas of the field as well as insight into current research and development work, and
- demonstrate specialised methodological knowledge in the main field of study.

Competence and skills
For a Degree of Master the student shall

- demonstrate the ability to critically and systematically integrate knowledge and analyse, assess and deal with complex phenomena, issues and situations even with limited information
- demonstrate the ability to identify and formulate issues critically, autonomously and creatively as well as to plan and, using appropriate methods, undertake advanced tasks within predetermined time frames and so contribute to the formation of knowledge as well as the ability to evaluate this work
- demonstrate the ability in speech and writing both nationally and internationally to report clearly and discuss his or her conclusions and the knowledge and arguments on which they are based in dialogue with different audiences, and
- demonstrate the skills required for participation in research and development work or autonomous employment in some other qualified capacity.

Judgement and approach
For a Degree of Master the student shall

- demonstrate the ability to make assessments in the main field of study informed by relevant disciplinary, social and ethical issues and also to demonstrate awareness of ethical aspects of research and development work
- demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used, and
- demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.

Outcomes of the study programme at Karolinska Institutet

Knowledge and understanding

After completing the programme the student must demonstrate knowledge and understanding

- of health care and social care as an organisation, its management and objectives,
- of basic computer and systems science, databases and web-based applications that are used within health informatics,
- of how IT can be used in health care and social care,
- of the terms and concepts in health care and social care, and
- of the health informatics research process.

Competence and skills
After completing the programme, students must demonstrate skills and ability to

- analyse and assess the need for health information systems for public, patients and care providers,
- analyse, characterise, evaluate and improve care's processes using information technology,
- develop, implement, improve and evaluate methods that support clinical decision-making,
- be involved in the procurement and the commissioning of health information systems,
- adapt, develop, implement, maintain, evaluate and improve health information systems,
- critically evaluate, select and apply health informatics standards,
- independently formulate relevant research questions within the health informatics field and on a basis of these, plan and implement projects,
- model, develop and implement systems for simulation and visualisation in health informatics, and
- manage projects and work successfully in collaboration with colleagues.

Judgement and approach
After completing the programme the student must

- be able to protect patients' privacy and security,
- be able to evaluate information and relate it to the established knowledge in the health informatics field, and
- have the ability to see the value of, as well as seek, collaboration with other professionals.

Description of the main field of study

Health informatics is an interdisciplinary field based on health sciences, computer systems science and social sciences. Health informatics has been developed on the basis of this to become a separate scientific field with its own scientific issues and methods. Health informatics is of fundamental importance for effective information management within health care, and for improving the quality of care and patient safety.

Studies within health informatics develop knowledge about healthcare needs and the needs of patients/citizens for effective, appropriate information and knowledge management, and how its methods can be used to promote safe,
knowledge-based, cost-effective, patient-centred and equal health care.

Knowledge within the field is applied primarily through research, teaching and development work in direct contact with care practitioners and employers, and with system suppliers and researchers within various medical and systems science fields. All application must be based on a professional attitude and in accordance with accepted ethical principles.

Content and structure

The programme includes four semesters with different themes based on a progression from previous semesters: bridging knowledge (semester 1), basic knowledge (semester 2) and in-depth knowledge of methods and applications in health informatics (semester 3), and finally research in health informatics

(semester 4).

The purpose of the first semester is to bridge the knowledge gap between students with an educational background in health care and those with a technical background. The first course conveys a common understanding of the main field of study as an academic as well as a practical discipline, and an understanding of the key challenges in health care, related to information and knowledge management. Bridging courses of a total of 15 credits provides basic knowledge in computer and systems science to students with a health care background. Likewise, the students who have a technical background will be provided with an understanding of the fundamentals of medical science and health care organisation. The semester's final course connects to the first course of the semester where challenges in health care were raised. Here, solutions are dealt with in the form of IT systems in health care.

The second semester includes courses dealing with basic knowledge and skills in health informatics; methods to carry out business analysis and modelling of user requirements, methods for evaluating different aspects of health care information systems after their introduction and health informatics standards.

Parallel to the courses in knowledge of methods in health informatics, a course with case pedagogy is given, in which scenarios from real health informatics projects are presented. This provides a starting point for a discussion of problems where students have the opportunity to apply their knowledge of methods. Students will thus have an insight into a broad range of complex but relevant projects. The semester ends with two project courses where an introduction to project management is given and that allow for the application of method knowledge gained in earlier courses.

The 3rd semester introduces methods within the area of clinical decision support and includes a course in modelling, simulation and visualisation in health informatics.

During the 3rd semester there is a block of 20 credits consisting of elective courses. This block provides an opportunity for a profile of the education in health informatics according to personal preferences. This block also provides an opportunity for international studies with one of the international universities that the programme has agreements with.

A degree project of 30 credits is written during the 4th semester.

Transitional provisions

This programme syllabus has been discontinued.

Other guidelines

Grading scale

An objective-related seven-point scale is used for grading on courses. The pass grades are A, B, C, D and E. The fail grades are Fx and F. Alternative grading scales may apply to modules within courses, elective courses or cross-programme courses. The grading scale is detailed in the course syllabus.

Language of instruction

The teaching language is English.

Specific eligibility requirements within the programme

To be eligible for semester 3 all courses in semester 1 and at least 10 credits from courses in semester 2 need to have been passed.

Study plan with constituent courses

For students starting the programme in 2013 or later:

Semester	Name of the course	Credits	Cycle	Depth of the course	Course given by
1	Health informatics needs, objectives and limitations	5	First	G2	KI
1	*Bridging courses:* Supplementary course in computer and systems science (15cr) *or* Basic medical science (7,5cr) *and* Health care organisation and management (7,5cr)	15	First		SU KI
1	Computer applications in health care and biomedicine	10	Second	AV	KI
2	User needs and requirements engineering	7,5	Second	AV	KI
2	Evaluation methods for health informatics	5	Second	AV	KI
2	Standardisation within health informatics	2,5	Second	AV	KI
2	Case studies in health informatics	5	Second	AV	KI
2	Projects in health informatics - from idea to specification	5	Second	AV	KI
2	Projects in health informatics – project and information management	5	Second	AV	KI
3	Clinical decision support	5	Second	AV	KI
3	Modelling, simulation and visualisation in health informatics	5	Second	AV	KI
3	Elective courses*	20	Second	AV	KI
4	Degree project in health informatics	30	Second	AV	KI

For students starting the programme in 2012:

Semester	Name of the course	Credits	Cycle	Depth of the course	Course given by
1	Health informatics needs, objectives and limitations	5	First	G2	KI
1	*Bridging courses*: Supplementary course in computer and systems science (15cr) *or* Basic medical science (7,5cr) *and* Health care organisation and management (7,5cr)	15	First		SU KI
1	Computer applications in health care and biomedicine	10	Second	Av	KI
2	User needs and requirements engineering	7.5	Second	Av	KI

2	Evaluation methods for health informatics	5	Second	Av	KI
2	Standardisation within health informatics	2.5	Second	Av	KI
2	Clinical decision support	5	Second	Av	KI
2	Case studies in health informatics	5	Second	Av	KI
2	Projects in health informatics - from idea to specification	5	Second	Av	KI
3	Modelling, simulation and visualisation in health informatics	5	Second	Av	SU
3	Projects in health informatics - from specification to product	5	Second	Av	SU
3	Elective courses*	20	Second	Av	KI and SU
4	Degree project in health informatics	30	Second	Av	KI and SU

* Students choose from a range of courses at Stockholm University and Karolinska Institutet. Before each school year, KI and SU will determine a number of courses from each university's regular course offerings which will form a pool of eligible courses. Among the elective courses is a course in research methodology. Students who do not already have this knowledge must choose this course.