Department of Computer and Systems Sciences

Stockholm University

Education plan

for

Joint Master's Programme in Health Informatics
Masterprogram i hälsoinformatik

120.0 Higher Education Credits
120.0 ECTS credits

Programme code:	SHINO
Valid from:	Autumn 2017
Date of approval:	2011-09-07
Changed:	2016-12-21
Department:	Department of Computer and Systems Sciences

Decision

This education plan was approved by the Faculty of Social Sciences, 2011-09-07.
Revised 2016-12-21.

Prerequisites and special admittance requirements

A Bachelor's degree or a professional degree equivalent to a Swedish Bachelor's degree of at least 180 ECTS in healthcare, biomedicine, medical technology, computer and systems sciences, informatics or the equivalent.

Proficiency in English equivalent to the Swedish upper secondary school course English 6/English B (with at least "pass" grade).

Programme structure

The programme is given as a joint programme between Stockholm University and Karolinska Institutet.

The program includes four semesters with different themes based on a progression from previous semesters: bridging knowledge (semester 1), basic knowledge (semester 2) in-depth health care informatics methods knowledge and applications (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 a health care education background and those with a technical education background. The first course conveys a common understanding of the main area as an academic as well as practical discipline, and an understanding of the key challenges in health care, related to information and knowledge management. There is then a course total of 15 credits that provides basic knowledge in computer and systems science to students with a health care background. Likewise, it provides students who have a technical background with an understanding of the fundamentals of medical science and health care organizations.
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 modeling of user requirements, methods for evaluating different aspects of health care information systems under/after their introduction and health informatics standards. In addition the students learn basic data analysis methods and attend an advanced course in scientific methodology.

The third semester gives an introduction to project management where the methods knowledge in data analysis is put into practice in project works. Furthermore students gain insight into current research topics in

health informatics through a research preparation course. Students then choose between a course in information security and a course in entrepreneurship.

A thesis of 30 credits is written during the fourth semester.
The courses are given in English.

Goals
Objectives for the advanced level according to the Higher Education Act
Education at the advanced level shall essentially entail building on the knowledge that students acquire at the basic level, or equivalent knowledge.

Education at the advanced level shall entail building on knowledge, skills and capabilities in relationship to the basic level education and, in addition to what applies to the basic education,
- further develop students' ability to independently integrate and use knowledge,
- develop students' ability to deal with complex phenomena, questions and situations, and
- develop students' potential for professional activities that place considerable demands on independence or on research and development work.

Objectives for the masters degree according to the Higher Education Ordinance
Knowledge and understanding
For master's degree, the student shall
- demonstrate knowledge and understanding in his/her main field of study, including both broad knowledge in the field and substantially deeper knowledge of certain parts of the field and insight into current research and development, and
- demonstrate deeper method knowledge in his/her main field of study.

Skills and abilities
For master's degree, the student shall
- demonstrate an ability to critically and systematically integrate knowledge and to analyze, assess and deal with complex phenomena, issues and situations, even with limited information,
- demonstrate an ability to critically, independently and creatively identify and formulate issues, plan and use appropriate methods for carrying out qualified assignments within specified time frames, thereby contributing to the development of knowledge and to evaluate this work;
- demonstrate an ability to present and discuss their conclusions and the knowledge and arguments behind them, orally and in writing, in dialogue with different groups, both nationally and internationally,
- demonstrate the skills required to participate in research and development work or to work independently in other advanced activities.

Assessment ability and approach
For the master's degree, the student shall
- demonstrate an ability to make assessments in the main field of study taking into account relevant scientific, social and ethical aspects, and demonstrate an awareness of ethical aspects of research and development,
- demonstrate insight into the possibilities and limitations of science, as well as its role in society and the responsibility for its use, and
- demonstrate an ability to identify his/her need for further knowledge and to take responsibility for his/her own development of his/her own knowledge.

Objectives of the master's programme in Health Informatics at Karolinska Institutet and Stockholm University

In addition to the national objectives, the following goals apply for the master's programme in Health Informatics at Karolinska Institutet and Stockholm University

Knowledge and understanding
After completing the programme the student will demonstrate knowledge and understanding
- of health care and social care as an organization, its management and objectives,
- of basic computer and systems sciences, information security, health informatics applications and e-services,
- 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

Skills and abilities
After completing the course, students must demonstrate skills and ability to

- analyze and assess the need for health information systems for public, patients and care providers,
- analyze, characterize, 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 a basis of these, plan and implement projects;
- model, develop and implement systems for simulation and visualization in health informatics, and
- manage projects and work successfully in collaboration with colleagues

Assessment ability and approach
After completing the education the student should
- 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.

Courses
In the list below the following three courses have Computer and Systems Sciences as main field of study:

- Supplementary course in Computer and Systems Sciences (semester 1)
- Introduction to Information Security (semester 3)
- Entrepreneurship in the digital society (semester 3)

The remaining courses have Health Informatics as main field of study.

Semester 1
- Health informatics – needs, objectives and limitations (5 credits, basic level), course leader: Karolinska Institutet

Bridging courses:
- Supplementary course in Computer and Systems Sciences (15 credits, basic level) or Basic medical science (7,5 credits, basic level) and Health Care Organization and Management (7,5 credits, basic level). Course leader: Stockholm University (Supplementary course in Computer and Systems Sciences) and Karolinska Institutet (Basic medical science and Health Care Organization and Management).

- Computer applications in health care and biomedicine (10 credits, advanced level), course leader: Karolinska Institutet.

Semester 2
- User needs, requirements engineering and evaluation (10 credits, advanced level), course leader: Karolinska Institutet.

- Standardisation within Health Informatics (5 credits, advanced level), course leader: Karolinska Institutet.

- Data Science for Health Informatics (7,5 credits, advanced level), course leader: Stockholm University.

- Scientific research methods (7,5 credits, advanced level), course leader: Karolinska Institutet.

Semester 3
- Project management and tools for Health Informatics (7,5 credits, advanced level), course leader: Stockholm University.

- Current research and trends in Health Informatics (15 credits, advanced level), course leader: Karolinska Institutet.

Plus one of the following courses:
- Introduction to Information Security (7,5 credits, advanced level), course leader: Stockholm University.
- Entrepreneurship in the digital society (7,5 credits, advanced level), course leader: Stockholm University.

Semester 4
Degree project in Health Informatics (30 credits, advanced level), course leader: Karolinska Institutet and Stockholm University.

Degree

The programme leads to a Master's degree. The main field is Health Informatics.

Misc

Students who have admitted to the programme and have not completed it within the planned two years of study, may request to complete the programme even after the education plan has expired. In this regard the limitations specified in the syllabi for the courses of the education, apply.

Admission requirements to the higher level semester

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