



Syllabus – Joint Master’s Programme in Health Informatics

5HI12

Established by the Board of Higher Education, 7 September
2011

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2011

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1. Basic Programme Information

1.1. Programme code	5HI12
1.2. Programme title	Masterprogrammet i hälsoinformatik <i>Joint Master's Programme in Health Informatics</i>
1.3. Number of credits	120 credits (120 ECTS credits)
1.4. Starting date	The syllabus applies to students who commence their studies in or after autumn 2012
1.5. 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.
1.6. Qualification	Masterexamen <i>Master of Science (120 credits)</i> Upon request, a student who meets the requirements for a qualification is to receive a diploma

2. Objectives

2.1. Objectives of second level according to the Higher Education Act

Second level education shall essentially build on the knowledge that students acquire in first level education or corresponding knowledge.

Second level education shall involve a deepening of knowledge, skills and abilities relative to first level education and, in addition to what applies to first level education, shall

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

2.2. Objectives of the Degree of Master according to the Higher Education Ordinance

Knowledge and understanding

For a Degree of Master students must

- demonstrate knowledge and understanding in their main field of study, including both a broad command of the field and considerably deeper knowledge of certain parts of the field, together with insight into current research and development work; and
- demonstrate deeper methodological knowledge in their main field of study.

Skills and abilities

For a Degree of Master students must

- demonstrate an ability to integrate knowledge and to analyse, assess and deal with complex phenomena, issues and situations, even when limited information is available;
- demonstrate an ability to critically, independently and creatively identify and formulate issues and to plan and, using appropriate methods, carry out advanced tasks within specified time limits, thus contributing towards the development of knowledge, and to evaluate this work;
- demonstrate an ability in both national and international contexts to clearly present and discuss their conclusions and the knowledge and arguments behind them, in dialogue with different groups, orally and in writing; and
- demonstrate the skill required to participate in research and development work or to work independently in other advanced contexts.

Judgment and approach

For a Degree of Master students must

- demonstrate an ability to make assessments in their main field of study, taking into account relevant scientific, social and ethical aspects, and demonstrate an awareness of ethical aspects of research and development work;
- demonstrate insight into the potential and limitations of science, its role in society and people's responsibility for how it is used; and
- demonstrate an ability to identify their need of further knowledge and to take responsibility for developing their knowledge.

2.3. Objectives of the Joint Master's Programme in Health Informatics at Karolinska Institutet and Stockholm University

In addition to the national objectives, the following goals apply for the Joint Master's Programme in Health Informatics at Karolinska Institutet and Stockholm University.

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.

Skills and abilities

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.

Assessment ability 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.

3. 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.

4. Content and structure

4.1. Main 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.

4.2. Teaching language

The teaching language is English.

5. Transitional provisions

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6. Other guidelines

6.1. 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.

6.2. Requirements for admission to higher semester

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.

7. Study plan with constituent courses

7.1. For students starting the programme in 2013 or later

Semester	Name of the course	Credits	Cycle	Depth of the course	
1	Health informatics needs, objectives and limitations <i>Hälsoinformatik – behov, mål och begränsningar</i>	5	First	G2	KI
1	<i>Bridging courses:</i> <ul style="list-style-type: none"> • Supplementary course in computer and systems science (15cr) <i>or</i> <ul style="list-style-type: none"> • Basic medical science (7,5cr) <i>Grundläggande medicinsk vetenskap</i> and • Health care organisation and management (7,5cr) <i>Vården och omsorgens organisation och styrning</i> 	15	First	--	SU KI
1	Computer applications in health care and biomedicine <i>Informationssystem i hälso- och sjukvården</i>	10	Second	AV	KI
2	User needs and requirements engineering <i>Verksamhetsanalys och användarkravhantering</i>	7,5	Second	AV	KI
2	Evaluation methods for health informatics <i>Utvärdering inom hälsoinformatik</i>	5	Second	AV	KI
2	Standardisation within health informatics <i>Standardisering inom hälsoinformatik</i>	2,5	Second	AV	KI
2	Case studies in health informatics <i>Fallstudier inom hälsoinformatik</i>	5	Second	AV	KI

2	Projects in health informatics - from idea to specification <i>Projekt inom hälsoinformatik – från idé till specifikation</i>	5	Second	AV	KI
2	Projects in health informatics – project and information management <i>Projekt inom hälsoinformatik – projektledning och informationshantering</i>	5	Second	AV	SU
3	Clinical decision support <i>Kliniskt beslutsstöd</i>	5	Second	AV	KI
3	Modelling, simulation and visualisation in health informatics <i>Modellering, simulering och visualisering inom hälsoinformatik</i>	5	Second	AV	SU
3	Elective courses* <i>Valbara kurser</i>	20	Second	AV	KI and SU
4	Degree project in health informatics <i>Examensarbete i hälsoinformatik</i>	30	Second	AV	KI and SU

7.2. For students starting the programme in 2012:

Semester	Name of the course	Credits	Cycle	Depth of the course	
1	Health informatics needs, objectives and limitations <i>Hälsoinformatik – behov, mål och begränsningar</i>	5	First	G2	KI
1	<i>Bridging courses:</i> <ul style="list-style-type: none"> • Supplementary course in computer and systems science (15cr) <i>or</i> <ul style="list-style-type: none"> • Basic medical science (7,5cr) <i>Grundläggande medicinsk vetenskap</i> and • Health care organisation and management (7,5cr) <i>Vården och omsorgens organisation och styrning</i> 	15	First	--	SU KI
1	Computer applications in health care and biomedicine <i>Informationssystem i hälso- och sjukvården</i>	10	Second	AV	KI

2	User needs and requirements engineering <i>Verksamhetsanalys och användarkravhantering</i>	7,5	Second	AV	KI
2	Evaluation methods for health informatics <i>Utvärdering inom hälsoinformatik</i>	5	Second	AV	KI
2	Standardisation within health informatics <i>Standardisering inom hälsoinformatik</i>	2,5	Second	AV	KI
2	Clinical decision support <i>Kliniskt beslutsstöd</i>	5	Second	AV	KI
2	Case studies in health informatics <i>Fallstudier inom hälsoinformatik</i>	5	Second	AV	KI
2	Projects in health informatics - from idea to specification <i>Projekt inom hälsoinformatik – från idé till specifikation</i>	5	Second	AV	KI
3	Modelling, simulation and visualisation in health informatics <i>Modellering, simulering och visualisering inom hälsoinformatik</i>	5	Second	AV	SU
3	Projects in health informatics - from specification to product <i>Projekt inom hälsoinformatik – från specifikation till produkt</i>	5	Second	AV	SU
3	Elective courses* <i>Valbara kurser</i>	20	Second	AV	KI and SU
4	Degree project in health informatics <i>Examensarbete i hälsoinformatik</i>	30	Second	AV	KI and SU

* Students choose from a range of courses at Stockholm University (SU) and Karolinska Institutet (KI). 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.