Kristiania

Programme description

Master of Human-Computer Interaction

120 credits

2023-2025
Full time (two years) or
Part time (first 60 credits with 50% progression, last 60 credits with 100% progression)

The study programme was accredited by NOKUT 23.01.18
The programme is re-accredited by The board 18.10.2022
The programme description has been approved by
The Education Committee 30.09.2022 (UU/EIT-case no. 129/22)

Innholdsfortegnelse

1. Introduction

The discipline of Human-Computer Interaction (HCI) is interdisciplinary in its core, and it brings together knowledge and understanding from computer science, design, psychology, and other related behavioral sciences. Candidates will acquire skills and competence in areas such as system interfaces, technology, software architecture, interaction design and cognitive aspects related to human-computer interaction.

The master program in HCI aims to meet current needs for better IT systems, by taking the user perspective into consideration throughout the design and development phase. It is targeted at candidates who want to influence and define how humans will interact with technology in the future, including designing and developing IT solutions. The Master program combines theoretical and practical approaches to HCI in order to provide advanced knowledge about versatile user needs and requirements for IT systems of high usability. Upon completion, candidates will be prepared for exciting challenges within contexts of HCI.

Relevance for public and private sector
Candidates from this program will work towards defining the ways humans interact with technology and will contribute to bringing technology forward as a premise for innovation and prospects within HCI. We increasingly depend on IT systems in our everyday lives, in everything from the work situation, to the use of cars and home appliances. Also, important tasks like banking services, medical services and voting depend on systems that everyone can use, independently of their personal abilities.

Understanding human abilities and limitations in interacting with technology is a crucial skill in the current and future work environment. Designing and developing technological solutions that people can use, will be crucial both to achieve a society without barriers, but also for companies that want to attract customers. Candidates from the HCI program will have the skills and knowledge to understand both the possibilities and limitations that lies in human-computer interaction.

What differs from existing interaction design programs is the interdisciplinary link between computer science and design. Candidates can choose their own focus; by gaining expertise within technologically-oriented HCI, or seek in-depth knowledge of human-oriented HCI, or to place themselves somewhere in between. There are no specific specializations in the programme, but the candidates can choose different focus areas through;

- choosing different electable topics, where some are technology-oriented, and some are more human-oriented,
- participating in different types of projects in some of the modules, i.e., developing prototypes or carrying out full implementations, and
- selecting and refining the topic of their master thesis, where some may be anchored in a technological paradigm, and others may be purely design- or human-oriented.

Nonetheless, they will all master a certain level of skills from both paradigms making them

able to bridge the gap between technology and design.

Relevance for further studies
As an academic field, HCI constitutes an extensive research community, which typically recruits PhD candidates from HCI or computer science master studies. The Master of HCI will provide a strong foundation for third cycle (PhD) studies, in the following ways:

- The broad theoretical curriculum, including the main areas of HCI research, will provide the candidate with a solid knowledge platform.
- Deep understanding and experience in prototyping, designing, implementing and evaluating state of the art IT artefacts and HCI solutions.
- The two research courses (*HCI – Methods and Frameworks* and *Research Design and Methodology*) will provide the candidate with methodological skills that fulfil the normal requirements for admission to a PhD programme.
- Working on their thesis, the students will develop the skills to conduct an independent research project.

Overall, the students will acquire academic depth and critical reflection as a foundation for a future PhD project.

1.1 Prerequisites

Applicants must meet the following requirements:

- Bachelor's degree in technology or a related field with an average grade of minimum C.
- Relevant practices, or other special considerations, may in some cases weigh up for non-compliant grade requirements.
- The applicants must also write a motivational letter of 500 words max in English.

Target candidates hold a Bachelor's degree in Computer Science, Information Technology, Information Systems, Human Computer Interaction, Interaction design or related disciplines like Psychology or other behavioural sciences.

It is *recommended* that you have prior knowledge of:

- Basic knowledge of web technologies, HTML and CSS
- A basic understanding of Usability and / or UX
- A basic understanding of interaction design
- Basic programming or scripting skills (e.g., Java, PhP, Python, JavaScript, etc.)

Language requirements:
Non-Scandinavian applicants must document their proficiency in English, in terms of speaking and writing English fluently documented by a TOEFL test (score 98) or an IELTS test (score 6.5).

For more information about admission requirements check our website:
https://www.kristiania.no/en/studies/masters-degree/human-computer-interaction/

2. Learning outcomes

All study programmes at Kristiania University College have adopted overarching learning outcomes that each student is expected to have achieved having completed the course. The learning outcomes describe what the student is expected to be able to do as a result of the learning acquired throughout the course. The academic outcome is divided into three categories: Knowledge, Skills and General competence.

Knowledge
The candidate…

- has advanced knowledge in human computer interaction as a research field, in terms of theories, knowledge claims, research methods, tools, technologies and professional standards
- has specialized knowledge within user-centred design and interaction design
- has knowledge in ICT solutions and specialised knowledge within architecture, implementation and SE methodologies relevant for HCI
- can analyze and explain professional issues based on the development of human-computer interaction, it's history and importance in society

Skills
The candidate…

- can reflect on how HCI methods contribute to close the gap between research findings, business needs and societal aims
- can design and implement interactive prototypes and user interfaces, using modern third generation web technology frameworks
- can find, assess and refer to information and technical material and present it so that it highlights a problem
- can reflect on their professional practice and adjust this under guidance
- can plan and execute a variety of tasks and projects that extend over time, alone and in groups, and in line with ethical requirements and guidelines

General competence
The candidate…

- has insight into relevant professional and ethical issues within HCI
- can exchange views and experiences with others with backgrounds in the art and thereby contribute to the development of good practice
- can communicate and convey key subject matter as theories, issues and solutions both in writing, orally and through other relevant forms of expression

- can master the relevant professional tools, techniques, frameworks, forms of expression and the terminology of the field, and present the results from extensive independent work
- can reflect on synthesised knowledge from the field of HCI and its implications, and gain new knowledge in the field of HCI

3. Programme structure and content

Master of Human Computer-Interaction is run over two years (full-time) or three years (part-time) with a total of 120 ECTS credits, where 90 ECTS credits is covered by mandatory courses and 30 ECTS credits are covered by elective courses or exchange. The courses are thought as modules, meaning that the students usually will complete one module before starting the next.

The programme runs over four (full-time) or six (part-time) semesters, and is built up as follows:

Semester	Master in Human-Computer Interaction Full time			
1. semester	**HCI Methods and Frameworks** 7,5 ECTS	**Interaction Design Studio** 7,5 ECTS	**UI Programming and Architectures** 7,5 ECTS	**Ethics, sustainability, and society** 7,5 ECTS
2. semester	**Visual Analytics** 7,5 ECTS	**Multimodal Interaction** 7,5 ECTS	**Research Methods** 7,5 ECTS	**Proposal Development** 7,5 ECTS
3. semester	Elective 30 ECTS			
	Student exchange/practice 30 ECTS			
4. semester	**Master Thesis** 30 ECTS			

Table 1. Courses matrix (full time)

Compulsory courses	Elective courses

Semester	Master of Science Human-Computer Interaction, Part time			
1. semester	**HCI Methods and Frameworks** 7,5 ECTS	**UI Programming and Architectures** 7,5 ECTS		
2. semester	**Visual Analytics** 7,5 ECTS	**Research Methods** 7,5 ECTS		
3. semester	**Interaction Design Studio** 7,5 ECTS	**Ethics, sustainability, and society** 7,5 ECTS		
4. semester	**Multimodal Interaction** 7,5 ECTS	**Proposal Development** 7,5 ECTS		
5. semester	Elective 30 ECTS			
	Student exchange/practice 30 ECTS			
6. semester	**Master Thesis** 30 ECTS			

Table 2. Courses matrix (part time)

Compulsory courses	Elective courses

3.1 Academic progression

The academic progression is described according to the full-time programme. For part-time students the chapter on the first semester will be their first and third semester, and the chapter on the second semester will be their second and fourth semester.

The first semester modules take the candidates through different aspects of designing, prototyping, developing, and testing software applications and user interfaces for HCI. The aim is to give the candidates the necessary foundation for specializing in their area of interest. In the first course, *HCI – Methods and Frameworks*, the students are introduced to theories, principles, methodologies and frameworks commonly used in the field. Typical research streams and challenges in HCI are also introduced. The following course, *Interaction Design Studio* gives the candidates a foundation in interaction design, making the students able to plan and conduct the design process, and become familiar with interaction design principles and frameworks. Theory and practical exercises, combined with group projects, give this common base. To provide the students with a more technical foundation, making them able to contribute to develop HCI technology and software, *UI Programming and Architectures* provides necessary knowledge and skills in designing, prototyping and implementing UI software solutions, bridging the gap between designers and programmers. Then the students get a common course in the general field of *Ethics, sustainability and society.*

The second semester starts with *Visual Analytics, which* introduces issues and theories of visualization and perception, in the context of business intelligence dashboards. Thereafter *Multimodal Interaction*, which is one of the most specialized subjects in the program, returns to and further explores the issues, concepts and solutions regarding technology, interaction and perception using one or more modalities, like sound, haptics, and smell, in addition to vision. This builds upon knowledge previously acquired in *Visual Analytics and UI programming and architecture.* The students are given the choice, depending on their skills and interest, to particularly focus on technical challenges related to development of multimodal solutions, or to focus on user and design related issues in the context of perception and modality. At the third course of the semester, the students are introduced to a variety of *Research Methods* together with the rest of the master students at SCEIT. At the end of the second semester, students get an opportunity to look for a topic for their masters thesis through *Proposal Development*.

During the third semester students get a chance to take a range of electives or go abroad for exchange. The last semester the candidates spend their time working on their master thesis. This enables the students to draw on and integrate wholly all learning, and through their project advance a small part of the academic field.

For part-time studentes and those who have a relevant part-time job, there is a possibility during the third semester to do practical work or preparation for conducting the masters thesis at the students worksplace/the industry.

3.2 Courses

Course name	Credits	Description
Specializtion courses		
HCI Methods and frameworks	7,5	The discipline of Human-Computer Interaction (HCI) involves knowledge and understanding of the system interfaces and the humans that interacts with them. The aim of this research area is to be able to build interfaces that work, and to evaluate them. Achieving this goal, requires a thorough understanding of the abilities and constraints of the people using computer interfaces. In this course, the student will be introduced to theories and frameworks commonly used in the area of HCI, in addition to becoming familiar with typical research issues and challenges studied in the field. The students will learn how to write a reaction paper.
Interaction Design studio	7,5	This module focuses on advanced topics in interaction design, exploring the various interfaces through which humans interact, and the characteristics of how human interaction is perceived as intuitive. The course will explore the sequential character of user experience based on the fields of Service Design and Design Thinking. The student will gain knowledge in the process from gathering user requirements, to design and implementation through lab-oriented development-methods.
Visual Analytics	7,5	Students will gain knowledge about theoretical principles of and computational techniques for visual analytics. The course will enable students to design, develop, and evaluate information dashboards for organizations. The students shall be able to reflect upon the different models, theories, and frameworks for technology integration from a visual analytics perspective.
UI Programming and Architectures	7,5	This course aims for the students to gain a foundation in how to program user interfaces and understanding of the underlying system architecture. Candidates will acquire advanced understanding in interaction techniques, design cycles and prototyping. Further knowledge of the terminology used by programmers aim to bridge the gap to developers. In practical skills the candidates will be required to design, implement and test/evaluate prototypes, through their developed user interfaces, chosen input/output techniques and executable programs. After successful completion of the course it is expected critical reflection on contemporary themes within user interfaces and the ability to critically discuss suitable UI approached to align with underlying system architecture.

Multimodal Interaction	7,5	Most interactions with the physical world involve several senses, along with the motor system. Similarly, many digital services are designed for natural experiences and intuitive interactions, aiming to accommodate human perception, performance and cognition. Multimodal interfaces process and align two or more combined user input modes, such as speech, touch, manual gesture, gaze, and head and body movements. The inputs are in turn processed and coordinated with multimedia system output, be it audio-visuals or even scents or haptic stimuli. These interfaces aim to recognise naturally occurring forms of human language and behaviour, which incorporate one or more recognition-based technologies (e.g. speech, pen, vision).
Common courses		
Ethics, sustainability and society	7,5	The main aim of this course is to provide students with the fundamental knowledge of ethics and sustainabilty necessary for responsible innovation and the development of new information technologies (IT) in the modern society. The central topics include the role of ethics in responsible innovation and IT development; social, economic, and environmental impacts of innovations and new ITs; and how IT development and innovation can contribute to achieving the UN Sustainable Development Goals. In covering ethical and sustainability issues, the course addresses the perspectives of various stakeholders at the individual level (IT developers, innovators, consumers, investors), the organizational level (commercial, public, and non-governmental organizations), and the societal level (local and regional communities, nations, international society). Group work on possible solutions to real-life ethical and sustainabilty challenges consitutes an essential part of the course.
Research Methods	7,5	This course is intended as an introduction to research methodology and the research process. This introduction gives the students an overview of the basic concept, methods, and practice of research. Research is a cyclical process where new and carefully planned investigations build and extend on established work. The aim is to provide students with a fundamental understanding of research as a conceptual, empirical, and practical approach to gathering new insight and knowledge. The content provides a broad overview of how researchers work within the fields of economy, innovation, and technology. It presents students with relevant methods from these domains, along with their possibilities and limitations. Students will learn a systematic approach to empirical investigation, including literature search, research design and methodology, qualitative and quantitative analyses, and the presentation and evaluation of results. At completion of the course, students will be able to study and interpret existing research on a topic and suggest approaches to broaden or deepen knowledge within a given topic.

Proposal Development	7,5	The overall objective of this course is to help students conceptualize and prepare a timely and relevant research proposal, and to nurture a sense of inquisitiveness and active participation in research. The course aims at offering insight into the process behind a successful research project. It has an applied approach that involves collaborative and reciprocal partnerships between the university (faculty, staff, and/or students) and external communities for the mutually beneficial exchange of knowledge and resources. The research proposal forms the basis for the master thesis and the allocation of supervisor(s).

3.3 Electable subjects

Elective courses may be subject to change.

Courses	Credits	Description
Prototype development	15	Students will gain the opportunity to do an in-depth analysis of a problem and produce a prototype to solve the problem.
Consulting and Leadership	7.5	This course focuses on the soft skills in management of information systems. Students will gain advanced knowledge of theories on leadership, change agents, ethics and required skills within IT-consultancy. They will acquire specialized problem-solving skills, being able to master the personal and organizational techniques required to participate in a change process, practicing leadership and developing professional skills within consulting. They shall take responsibility to conduct a minor consulting project thru an agreement, plan and evaluation.
Emerging Technologies	7.5	The student will during a lecture series, study, read, digest, and process academic literature in an advanced area not offered by other existing courses. The course explores the current and potential future impacts of new, emerging, and rapidly evolving technologies in human-computer interaction and computer science. Students will gain insights into these technologies and how society, organizations and people are coping (or not) with the resulting disruption. The student will demonstrate their mastery of the material by a combination of oral discussions with the faculty members and co-students; exercises set by the faculty member accompanying the readings; and a written summary synthesizing the material that the student learned. Overall, the student will gain a broader and deeper perspective of the emerging areas in the fields.
Mobile Computing and Internet of Things	7.5	Students will gain in depth knowledge of mobile computing and introduce the Internet of Things (IoT). Students will further acquire knowledge of theories/models of mobile and pervasive computing applications, technologies and common research paradigms in mobile and pervasive computing such as context awareness, computing in an environment with limited resources, sensor-based interaction, and smart-device management. They will acquire skills in application design, architecture, and implementation.
Agile Project Management	7,5	Organizations need to develop project managers who can complete projects on time and within budget and this course addresses challenges such as the ability to manage projects and stakeholders, risk assessment and agile planning. Students will gain advanced knowledge of the key theories of project management and agile development. They will acquire specialized problem-solving skills, being able to plan and run a time-boxed iteration,

		and to use a project management tool. They shall take responsibility to conduct plan, organize and control an agile IS project.
Interactive Technologies	7,5	The aim of the course is to design, develop and evaluate interactive technologies with a focus on the enterprise context of use. Students will be immersed in a pedagogical experience that covers the full spectrum of design, development, use and evaluation of innovative and interactive enterprise technologies using smartphones, tablets, motion controllers, touch tables, and touch walls. Natural User Interfaces (NUI) will be a special focus of the course. Students will use state-of-the-art mobile eye-tracking solutions to evaluate the applications/products designed and developed.

3.5 Master Thesis (30 ECTS credits)

Courses	Credits	Description
Master Thesis	30	The master thesis is a research project in which students will apply the knowledge acquired during their studies. It is a crafted scholarly document presenting research questions and original arguments based on scientific methods under the guidance of an advisor. The thesis gives the student the opportunity to demonstrate expertise in their chosen research area. Students will acquire specialized problem-solving skills, being able to plan and conduct the steps in the research and/or development process at a high methodological standard. They shall take responsibility to conduct a well planned and executed project.

4. Teaching methods

The individual courses, except the thesis, are structured in block mode for four weeks. The first two weeks will be a combination of lectures, case studies, in-class presentations and lab work. Guest lectures will be organized on chosen topics. Students work in groups under supervision. The two last weeks are for self-study, project work and oral exam. The master thesis is a self-organized period of study where the students draw upon plenary lectures, individual supervision and self-organized group work.

Overall, the programme will draw on a combination of lecturing forms:

- Lectures, to introduce theoretical issues and domain knowledge.
- Seminars and group work, to give the students the opportunity to discuss different perspectives, integrate with previous knowledge, and practice analytical assessment of case materials.
- Practical assignments and lab work, to develop hands-on technical skills.
- Directed and student-selected readings, to develop a solid knowledge base.
- Technical demonstrations, to present and convey the technical workings and user interaction aspects of an IT artefact.
- Oral presentations, to develop personal communication skills.
- Essay and thesis writing, in order to synthesize knowledge and present analyses and results.
- Supervision, to provide detailed feedback and discussion of student projects in close interaction with Høyskolen Kristiania researchers.

4.1 Forms of assessment

Regarding assessment forms, the students will write essays, technical reports, articles, reflection documents, poster, and similar written hand-ins. In addition, oral presentations, poster demonstrations, product demonstrations, prototyping, and lab work are examples of other assessment forms. There are usually one or two assessments in each module, and it will alternate between individual assignments and group-based assignments. For the Master Thesis in the last year, there will be both a written thesis document and an oral presentation.

5. Internationalization and international student exchange

The course has schemes for internationalisation and international student exchanges, according to the Regulations on the Supervision and Control of the Quality of Norwegian Higher Education (Studietilsynsforskriften) of February 2017 (§ 2-2, sections 7 and 8)

The schemes for internationalisation are adapted to the level, scope and uniqueness of the course.
The content of schemes for international student exchanges is academically relevant.

5.1 Internationalization

Internationalization means the collective efforts regarding international activities. The internationalization efforts at the department of Technology includes research collaborations, staff- and student exchange, participation in international conferences, publications, competitions, displays, etc. The students are actively involved in our international network and its activities at Kristiania University College enabling them to gain valuable insights and experiences. Scientific staff is given options for participating in their international networks to keep their knowledge up to date, gain valuable experiences and share and learn new pedagogical techniques. Our membership in networks such as Erasmus+ and Nordplus, give students and academic staff rich opportunities.

For the specific courses in the programme, they are all taught in English, thereby facilitating for incoming exchange students. Historically, approximately one third of the class size consists of international students which encourages an international student environment. Further, in several courses there are guest lectures delivered by international visiting staff. Some of the courses are also delivered by international staff in adjunct positions from our partner institutions such as Copenhagen Business School, Denmark and Brunel University, UK. Through coursework and assignments, the students will work on cases from international actors and companies, relating their reflections, discussions and hand ins to a global IT industry and its professional community.

For specific internationalization schemes, see the subject description of the study.

5.2 International student exchange

With regard to schemes for international student exchanges, the university college offers the following mobility programmes;

- Nordplus in the Nordic and Baltic countries
- ERASMUS+ in Europa
- ‘Study Abroad’, for students within and outside Europe

Kristiania University College has agreements on student exchanges and academic relevance secured by the academic field of study. Exchange courses from partners are approved by academic supervisors, for admission to the program, with an equivalent of 30 credits.

For nominations for student exchange, requirements are set for grades and motivation applications. For some study programmes there are requirements for documentation of creative work / portfolios.

For students at Master of Human-Computer Interaction student exchange is possible during the 3. semester. For outgoing students, Kristiania University College, has established student exchange agreements with the following institutions:

- Kingston University, UK: Master Programme
- Seoul, South-Korea: Seoul National University of Science and Technology
- England: University of Hertfordshire, UK
- New Zealand: Otago Polytechnic New Zealand (1 student only)

Changes to approved universities may occur. Information about possible exchange stays for the relevant year is therefore published online and on the learning platform.