Kristiania

Programme description
Master in Immersive experiences

120 credits

2023-2025

The study programme was accredited by The Board 09.12.22
The programme description has been approved
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Content

1.   Introduction

Our interaction with computers is transforming. The 2d web with text, pictures and video is becoming much more immersive. Exactly how this technology will look is still unclear; we do however know the outline of it. Technologies we know as virtual reality (VR), augmented reality (AR) or extended reality (XR) may develop into something that has the place in the world our current web has, ubiquitous in daily life, both for work and leisure.

Master in Immersive experiences aims to equip the next generation of developers for these new experiences. Master in Immersive Experiences will bring together digital artists, game designers, user experience designers and technologists in an environment where we create ground-breaking immersive experiences. Topics such as usability and accessibility in virtual worlds, working with the existing technologies to create immersive experiences, and the aesthetics of the digital future will let students explore these opportunities in detail. Furthermore, teamwork is critical for the success of these experiences and products. No individual can create this future alone, thus the master emphasis modern teamwork practices. People with different background working together towards a common goal will be another core topic for the degree.

Candidates will take responsibility for solving complex tasks and conducting a research project at a high standard. This includes the ability to choose the appropriate research approach, to choose or develop a solution, to handle relationships ethically and professionally, and to evaluate and communicate the results in a systematic manner.

Relevance for industry
Graduates will be able to fill roles both in current and future industries. As experts on leading edge technologies, they will be clear candidates to innovate, design, implement and test games, teaching material, healthcare applications, and other experiences using immersive technologies.

In addition to the relevance for various immersive technologies, the graduates are also highly desirable for their competence in participating in and managing cross disciplinary teams. Further, the underlying practices, concepts and theories are still grounded in computer science. Thus, graduates are also very much able to fulfil traditional roles in the IT industry such as developers or consultants.

Typically, graduating candidates can fill positions as:
- Virtual Realty developers
- Augmented Reality developers
- Experience designers

- Software or system developers
- IT consultants
- Project managers
- Innovators

Relevance for further studies

This degree covers multiple academic fields, where each constitutes an extensive research community. Further there is an emerging field of specialized researchers within VR, AR and XR. Thus, the master's degree in immersive experiences allows for multiple PhDs, depending on an individual's main topics of interest. Master in Immersive experiences will provide a strong foundation for third cycle (PhD) studies, in the following ways:

- The broad theoretical curriculum from multiple areas, will provide the candidate with a solid knowledge platform.
- Deep understanding and experience in prototyping, designing, implementing and evaluating state of the art immersive experiences, and researching their implications.
- The solid research method courses 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 within the fields of Computer Science, Information Technology, Information Systems, Human Computer Interaction, Game Design, 3D graphics, digital visual arts, film and TV, sound design, visual effects, or related fields with an average grade of minimum C.

Language requirements:
- Non-Scandinavian applicants who do not have English as their native language 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).

1.2   Recommended skills

In addition, it is recommended that the candidate has competency in one programming language.

2.   Learning outcomes

All study programmes at Kristiania 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…

- advanced knowledge of immersive experiences as research fields, in terms of knowledge claims, processes, tools, technologies and professional standards.
- Specialized insight into the theory and practice of developing for virtual reality, augmented realty and extended reality and evaluate the products
- Thorough knowledge of existing findings, research methods such as design science research and theories within immersive experiences
- advanced knowledge of how to utilize and apply research findings, both within the field and adjacent to the field to build immersive
- can analyse academic and artistic results and products in relation to existing work and practices within the different fields involved in immersive experiences, such as technology, visual arts, and design.

Skills

The candidate…

- can analyse and critically evaluate existing text, both scholarly and practical as well as actual products to describe and discuss key immersive technologies in a structured manner using scholarly arguments
- can analyse existing theories, methods and designs to develop and evaluate immersive experiences through independent work as well as cross disciplinary projects
- Can independently use design science or artistic approaches to develop useful, artistic or entertaining products within using interactive technology to solve problems on individual and societal scales
- is able to work in and lead cross-disciplinary teams with visual artists, sound artists, interaction designers and technologists to create the next generation experiences.

General competence

The candidate…

- can analyse academic, professional and ethical problems in a constantly developing environment of immersive experiences
- can apply their knowledge and skills to take responsibility for solving new complex tasks and conducting a research-based immersive experiences project at a high standard.

- Can communicate extensive independent work and masters language and terminology within and between the fields required to develop immersive experiences
- can communicate academic issues, analyses and conclusions about immersive experiences, both with specialists and the general public
- can contribute to new thinking and innovation within immersive experiences

3. Structure and content

The program is run over two years (full-time), that counts a total of 120 credits. The program does not offer part-time studies. The first year offers 5 specialization courses, in addition to 3 courses shared with existing master programs at the school. The third semester offers 3-4 electable courses. The last semester focuses on the Master Thesis. The courses are thought as modules, meaning that the students usually will complete one module before starting the next.

The students may also apply for a semester of international exchange or internship.

Semester	Programme structure - Master in Immersive Experiences - Full time			
1. semester	Fundamentals of immersive interaction 7,5 ects	Immersive technology development 7.5 ects	Design of immersive experiences 7,5 ects	Ethics, sustainability and Society 7,5 ects
2. semester	Immersive development project 15 ects		Research methods 7,5 ects	Proposal Development 7,5 ects
3. semester	Electives* 30 ects			
	Alternatively: Student exchange/practice 30 ects			
4. semester	Master Thesis 30 ects			

Table 1. Course matrix

Compulsory courses	Elective courses

* Which elective courses that may be offered may be subject to change.

3.1   Academic progression

The first semester provides the students with deep knowledge and advanced skills within the field of immersive experiences, as well as a foundation in ethics and responsibilities. The second semester provides important research methods and proposal development, while giving the students hands on experience developing a usable immersive experience. This semester also contains common modules in innovation and society as well as starting to develop their master's project.

Third semester gives opportunities for exchange or electives. Students wishing to develop a larger individual research and development project may elect to start on their master's thesis in this semester. The last semester is dedicated to the master's thesis.

3.2   Courses

Courses	Credits	Description
Fundamentals of immersive interaction	7,5	This course will provide students with both a robust foundation in theory as well as practical understanding of the state-of-the-art in respect of methods, tools and techniques required to conceive, design and evaluate immersive interactive environments.
Immersive technology development	7,5	The aim of this course is to provide students with an in-depth understanding of digital technologies underpinning AR/VR/XR and the necessary approaches and skills required to be able to select and apply their appropriate use for any given AR/VR/XR challenge to improve the end user experience.
Design of immersive experiences	7,5	This course gives insight in design principles and approaches that can be used to produce immersive experiences across technologies. The student will learn to analyze a need of potential users and design an immersive experience to satisfy these needs. Students will also learn to use and artistic approach to develop novel experiences.
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 broadly. 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.

Immersive development project	15	This course provides students with advanced knowledge of the key theories of project management and agile development in cross-disciplinary teams. They will acquire specialized problem-solving skills, being able to plan and run a time-boxed iteration, and to use a project management tool. Students will plan, conduct, organize and control an agile project for developing immersive experiences products.
Ethics, sustainability and society	7.5	The main aim of this course is to provide students with the fundamental knowledge of ethics and sustainability 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 sustainability challenges constitutes an essential part of the course.
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).

Table. 2 Obligatory courses

3.3 Electable courses

Which elective courses that are offered 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	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.
Integration Oriented Architecture	7.5	This course introduces interaction-oriented software architectures, to provide the students with analytical skills, development methodologies and technological skills that are necessary to analyse, plan and implement architectures for integration projects. The course will be taught in the context of enterprise systems and distributed systems, which means that issues of network protocols, scalability and security will be emphasized.
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.

Table. 3 Electable courses

3.4 Master Thesis

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.

Table 4 Master Thesis

4.   Teaching methods

Masters of immersive experiences is designed so that the sum of the courses and the study work with these will lead the students towards the intended learning outcome described in chapter 2. of this program description.

The individual courses are put together to show a breadth of knowledge, skills and general competence that reflects the field of practice. Some of the courses are more oriented towards knowledge exchange, others more oriented towards building specific skills, while others include more skills in links between theory and practice. This is reflected in the teaching.

Forms of work, teaching and assessment in the individual courses have been chosen to provide a good and meaningful correspondence between the learning outcome that is desired to be achieved, the teaching methods used, and the exam that concludes the course.

The methodological choices also reflect the course's contribution to the study program. The students therefore encounter a varied set of learning activities throughout the study period, a variation that in total should reflect the field of practice the student is studying for.

The master's program emphasizes that students learn to use relevant methods from research and professional development work and artistic development work. This will contribute to the students through their master's studies being able to complete an independent, limited research or development project or artistic work under supervision and in line with current academic and ethical norms. In order to secure this, the teaching will include emphasize commenting on, illustrating, and elaborating material from teaching materials, as well as providing guidance and additional material that is not available in printed form.

As with all higher education, Kristiania also sets requirements for students' own independent learning work. The college sees it as its task to facilitate and facilitate the students' work through good learning designs. At the same time, we emphasize that a teacher can only communicate and facilitate. The actual learning takes place with the individual student as a result of the student's own work. In connection with the teaching, the student must therefore expect a significant personal effort.

The most important forms of work, teaching and assessment the student encounters in the Master in immersive Experiences program name are described in the following.

- 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 with 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 synthesise knowledge and present analyses and results
- Supervision, to provide detailed feedback and discussion of student projects in close interaction with Kristiania University Collage researchers.

For students who need tutoring beyond scheduled teaching, the college has available subject resources, including administrative staff, librarians, digital learning resources (e.g., online movies) and student tutors. These can be contacted by the individual student if needed.

In addition to literature and help with literature searches, the library also offers varied training in academic writing.

During study, course-specific academic events are held, where guest lecturers, external organizations and business actors can participate. The projects can be managed by the course coordinator and / or students and supported by administrative resources. For Master in immersive experiences, this is relevant for the course immersive experiences project as well as multiple electives. See the course description for more information.

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.

For additional information about exams and compulsory activity, see Kristiania's website.

5.   Internationalization and international student exchange

With reference to *Studietilsynsforskriften* of February 2017 (§2-2, sections 7 and 8), the study has arrangements for internationalization and international student exchange.

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 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.

Specifically for this programme, all courses are 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. Some courses are thought by lecturers who have a main affiliation abroad. Further, in several courses there are guest lectures delivered by international visiting staff. 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

Regarding schemes for international student exchanges, the university college offers the following mobility programs:
-    Nordplus in the Nordic and Baltic countries
-    ERASMUS+ in Europa
-    'Study Abroad', for students within and outside Europe

Kristiania 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 in Immersive Experiences student exchange is possible during the third semester. While on exchange the student will be able to start their master thesis with an advisor from Kristiania. For outgoing students, Kristiania, has established student exchange agreements with the following institutions:

- Kingston University, UK
- Arcada University of Applied Sciences, Finland
- Seoul National University of Science and Technology, South Korea
- University of Hertfordshire, UK
- Assumption University, Thailand

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