

**REGULATION**Decision-maker
PresidentValid from
2018-09-26Revised as of
2022-12-16Reference number
V-2021-0837Entity responsible for
supervision and questions
School of Architecture and the
Built Environment

General syllabus for education at third-cycle level in the subject of History of Science, Technology and Environment

This regulatory document has been decided by the President pursuant to chapter 6 sections 26-27 of the Higher Education Ordinance. The regulatory document is valid with effect from 26-09-2018 and was last modified on 16-12-2022 (V-2021-0837) The regulatory document regulates the main content of the education, requirements for special qualifications and the other regulations that are needed. The School of School of Architecture and the Built Environment is responsible for review and questions about the governing document.

1 Content of the education

1.1 The name of the subject in Swedish and in English translation

Historiska studier av teknik, vetenskap och miljö, History of Science, Technology and Environment

1.2 Subject description

In the third-cycle subject of history of technology, science and environment, technical, scientific and environmental change process are studied from historical perspectives. One aspect emphasised is studying drivers in society and ideas behind such change processes. Another is studying the social and cultural impacts of such drivers. The subject encompasses both humanities and social science.

The third-cycle education in history of technology, science and environment is intended to provide the student with a good overview of current research and older knowledge-based traditions in the area, as well as good theoretical and methodological training.

The principal purpose of the education is to provide a foundation for independent scientific research activity in the area.

Admission to the subject takes place with or without specialisation.

1.3 Specialisations

The subject has one specialisation: The humanities of the environment

Within this specialisation of the humanities of the environment, there are specialised studies in the interdisciplinary research field that has emerged in parallel with understanding of our age as the epoch of humanity, the Anthropocene.

Examples of disciplines that have contributed to this field are environmental history, climate history, ecocriticism, environmental philosophy, political ecology, environmental justice, geography, anthropology and various types of sustainability studies. In methodological and

theoretical terms, the specialisation consequently encompasses many approaches, and this diversity is one of the field's strengths.

1.4 Organisation of the education

The courses and study programmes consist of a course component and a thesis component. The work is conducted independently and in cooperation with supervisors and in some cases other project assistants.

1.4.1 Activities for fulfilment of outcomes for the education according to the Higher Education Ordinance (HF)

Below are described activities for the doctoral student's fulfilment of the learning outcomes for third-cycle education according to the Higher Education Ordinance (HF) and KTH's goals. The individual study plan specifies the activities for each individual doctoral student.

Learning outcomes: Knowledge and understanding

For the Degree of Doctor the doctoral student shall:

- Demonstrate broad knowledge and a systematic understanding of the research field as well as advanced and up-to-date specialist knowledge in a limited area of this field.

This objective can be obtained for example by:

- carrying out own research in the research area, and
- reading scientific articles and books, attending courses and actively taking part in conferences, seminars and workshops in the research area.
- Demonstrate familiarity with research methodology in general and the methods of the specific field of research in particular.

This objective can be attained for example by:

- learning to identify and formulate relevant questions in the research field and discussing how collection of material and analysis should be done to answer these questions;
- reading scientific literature in the field and related fields, discussing and reflecting on selected scientific methods and research approaches;
- actively participating in seminars and conferences and in discussions in which theory and methodology are discussed; and
- completing the compulsory courses on Theory and Method in History, Part 1 7.5 HE credits AK3104 Theory and Method in History, Part 2 7.5 HE credits.

For a Degree of Licentiate, the doctoral student shall:

- Demonstrate knowledge and understanding in the field of research including current specialist knowledge in a limited area of this field as well as specialised knowledge of research methodology in general and the methods of the specific field in particular.

This objective can be obtained for example by:

- discussing and formulating relevant questions, planning and implementing collection of materials and analysis in order to answer these;
- assisting in the writing of scientific text based on own research results;
- actively taking part in seminars with a special focus on scientific method;
- reading scientific literature in the field and discussing selected approaches and methods, implementation of studies, reliability of obtained results and conclusions; and
- reading Theory and Method in History, Part 1 7.5 HE credits to obtain an overview of different methods and research approaches and familiarity with scientific method.

Learning outcome: Competence and skills

For the Degree of Doctor the doctoral student shall:

- Demonstrate the capacity for scholarly analysis and synthesis as well as to review and assess new and complex phenomena, issues and situations autonomously and critically.

This objective can be attained for example by:

- practising analysing/interpreting and compiling various kinds of information into a context relevant to the question;
 - practising thinking in an interdisciplinary manner;
 - reviewing, discussing and providing constructive feedback on other doctoral students' texts; and
 - practising independently evaluating reasons why empirical studies have not produced the expected results and discussing how these insights can be used to carry the project/question forward and/or provide ideas for new questions.
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- Demonstrate the ability to identify and formulate issues with scholarly precision critically, autonomously and creatively, and to plan and use appropriate methods to undertake research and other qualified tasks within predetermined time frames and to review and evaluate such work.

This objective can be obtained for example by:

- practising independently planning and executing studies/investigations in a reliable manner, including a review of existing literature to be able to formulate a relevant scientific question that is to be answered, planning appropriate empirical investigations;
- participating actively in research seminars where others' studies/investigations are analysed and discussed;
- attending courses in scientific method, such as Theory and Method 1 and 2.

- Demonstrate through a dissertation the ability to make a significant contribution to the formation of knowledge through his or her own research.

As the thesis plays such a key role in the third-cycle education, there are several activities that promote the attainment of this objective. Supervisor sessions are used to plan and discuss the research to be included in the thesis. Chapters or articles are presented at seminars and conferences. Thesis text is presented at the higher seminar on at least three occasions – thesis memorandum, mid-point seminar and final seminar.

- Demonstrate the ability in both national and international contexts to present and discuss research and research findings authoritatively in speech and writing and in dialogue with the academic community and society in general.

This objective can be attained for example by:

- participating in, and successively to an increasing degree being independently responsible for, the writing of scientific papers/articles based on own research findings;
- participating actively in research seminars and scientific conferences/meetings by presenting own research findings and own scientific papers/articles; and
- attending the course 1N5504 Research Communication 7.5 HE credits

- Demonstrate the ability to identify the need for further knowledge.

This objective can be attained for example by:

- participating in and being increasingly responsible for, the writing of scientific articles/papers, primarily by independently searching for and reading scientific literature that relates to own research;
- staying informed about current research related to the thesis work and on the basis of this information practising identifying and formulating questions it would be justified to investigate;
- participating actively in project planning, both as regards continuation of ongoing projects/studies and planning new projects/studies and learning to identify needs for new knowledge before the project can be planned and implemented.

- Demonstrate the capacity to contribute to social development and support the learning of others both through research and education and in some other qualified professional capacity.

This objective can be attained for example by:

- developing his/her pedagogical abilities, for example by attending courses in higher education teaching;
- participating actively in teaching and supervision of students;
- participating in third-stream activities, i.e. presenting and in different ways disseminating information on science and own research to society;
- identifying questions in own research field that can contribute to a better society;
- presenting his/her research in different contexts, for example at conferences or workshops aimed at different target groups (researchers, practitioners, representatives of industry/school/other authorities) or in popular science contexts; and
- attending the course Research Communication 7.5 HE credits.

For a Degree of Licentiate, the doctoral student shall:

- Demonstrate the ability to identify and formulate issues with scholarly precision critically, autonomously and creatively, and to plan and use appropriate methods to undertake a limited piece of research and other qualified tasks within predetermined time frames in order to contribute to the formation of knowledge as well as to evaluate this work.

This objective can be attained for example by:

- participating in, and successively to an ever greater extent being responsible in an independent manner for planning of new studies, including formulation of questions to be answered and choice of suitable scientific methodology;
 - practising independently and critically analysing and evaluating different kinds of information such as results from own empirical studies, literature, presentations at conferences, etc., and based on these proposing how these insights can be combined to take the question forward;
 - training in critically analysing and interpreting complex results from different studies, including those that have produced unexpected results, and based on these identifying new opportunities for new knowledge and new questions;
 - participating actively in research seminars where others' texts/studies are analysed and discussed
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- Demonstrate ability in both national and international contexts to present, discuss research, and research findings in speech and writing and in dialogue with the academic community and society in general.

This objective can be attained for example by:

- participating in, and successively to an increasing degree being independently responsible for, the writing of scientific papers/articles based on one's own research findings; and
 - participating actively in research seminars and scientific conferences/meetings by presenting one's own research findings and one's own scientific papers/articles.
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- Demonstrate the skills required to participate autonomously in research and development work and to work autonomously in some other qualified capacity.

This objective can be attained for example by:

- teaching at first-cycle and second-cycle level; and
- fulfilling the collaborative task by participating in activities that involve contact with other qualified activities.

Learning outcomes: Judgement and approach

For the Degree of Doctor the doctoral student shall:

- Demonstrate intellectual autonomy and disciplinary rectitude as well as the ability to make assessments of research ethics.

This objective can be attained for example by:

- discussing research-ethical aspects of their own research and the meaning and importance of scientific integrity;
 - practising formulating and identifying new executable research ideas, suggesting scientific methodology to investigate these ideas;
 - taking the course Introduction to the Research Process 7.5 HE credits, in which ethics is an element.
- Demonstrate specialised insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used.
 - This objective can be obtained for example by reflecting on and discussing the possibilities and limitations of science, both in general and in relation to one's own research.

For a Degree of Licentiate, the doctoral student shall:

- Demonstrate the ability to make assessments of ethical aspects of his or her own research.

This objective can be attained for example by:

- carrying out their research tasks accurately, systematically and with scientific integrity;
 - discussing research ethical aspects and scientific integrity at supervision sessions or seminars.
 - taking the course Introduction to the Research Process 7.5 HE credits.
- Demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used.

This objective can be obtained for example by reflecting on and discussing the possibilities and limitations of science, both in general and in relation to one's own research.

- Demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.

This objective can be attained for example by:

- staying informed about current research related to the thesis work, and based on this information practising identifying and formulating questions it would be justified to investigate; and
- participating actively in project planning, both as regards continuation of ongoing projects/studies and planning new projects/studies and learning to identify needs for new knowledge before the project can be planned and implemented.

KTH's outcome in sustainable development

For both the Degree of Licentiate and the Degree of Doctor, the doctoral student shall:

- Demonstrate with knowledge and skills the ability to be able to contribute to sustainable societal development towards an equal, inclusive and climate-neutral society.

Development is sustainable if it meets the needs of present generations without jeopardising the ability of future generations to meet their own needs. It includes social, economic and environmental dimensions, which also implies knowledge of gender equality and justice. The objective of sustainable development is attained through the supervised thesis work, in which

sustainability-related research issues linked to the student's own thesis area are identified and discussed, and through completion for example of the compulsory third-cycle courses Introduction to the Research Process 7.5 HE credits and Perspectives on Historical Studies of Technology, Science and Environment 15 HE credits. The objective is also attained through participation in seminar activities and other activities in the framework of humanities of the environment, where all dimensions of sustainable development have a place.

1.4.2 Compulsory courses

Compulsory courses must be taken corresponding to 30 HE credits for the Degree of Licentiate and 45 HE credits for the Degree of Doctor.

Courses in theory and method:

Theory and Method 1 7.5 HE credits

Theory and Method 2 7.5 HE credits

Process courses:

Research Communication 7.5 HE credits

Introduction to the Research Process 7.5 HE credits

Extension course:

Perspectives on the History of Science, Technology and Environment 15 HE credits

Introduction to the Research Process, Theory and Method 1, and Perspectives on Historical Studies of Technology, Science and Environment are compulsory for the Degree of Licentiate.

If the doctoral student intends to teach during their studies at third-cycle level, a higher education pedagogy course of at least 3 HE credits is required. A higher education pedagogy course is also recommended for those who do not teach.

1.4.3 Recommended courses

As well as the compulsory courses, the doctoral student must take optional courses at KTH or another university, or individual independent studies drawn up in cooperation with the supervisor.

Courses in the following fields of knowledge are recommended for doctoral students in historical studies of technology, science and environment: anthropology, ecocriticism, economic history, research policy, gender theory, history of ideas, industrial heritage research, environmental history, the humanities of the environment, political ecology, history of technology, technological and scientific studies, history of science and philosophy of science.

Following agreement with the principal supervisor and following a decision by the Director of Third-Cycle Education at the school, credits can be granted in the individual syllabus for courses taken at first-cycle and second-cycle level with a maximum of 15 HE credits (of which not more than 10 HE credits at first-cycle level).

Courses for the specialisation of Humanities of the Environment:

At least 15 HE credit courses are compulsory within the specialisation. These may be courses for example on the humanities of the environment, environmental history, environmental philosophy, political ecology, industrial heritage research or climate history.

1.4.4 Conditional elective courses

1.4.5 Requirements for the degree

Degree of Doctor

A Degree of Doctor comprises 240 credits. At least 120 credits must consist of the doctoral thesis

Thesis

Quality requirements and possible other requirements for the thesis.

The purpose of the thesis is for the doctoral student to develop an ability to make independent contributions to the research and an ability for scientific cooperation, within and outside his/her own subject.

The thesis must thus be based on independent research. The doctoral student's contribution to texts included in the thesis that have several authors must be distinguishable.

The thesis can take the form either of a compilation of scientific articles or of a monograph. In a compilation thesis there must be a specially authored summary, known as a kappa, which links the separate articles together. A monograph consists of several chapters that together form a coherent argument. Irrespective of whether the thesis is intended to become a monograph or a compilation thesis, international publication of results obtained must be aimed for during the study programme period. The quality review of both types of thesis takes place continuously in supervision and through seminar discussion. For published articles, both those included in a compilation thesis and those based on parts of a monograph, there is additional external review. The thesis is normally written in English but can also be written in Swedish. If it is to be written in Swedish, an application must be made to the Director of Third Cycle Education at the School.

Irrespective of whether it is presented as a monograph or as a compilation of scientific articles, a thesis must be of such quality that it is assessed as being capable of forming the basis for at least four articles that can be published in peer-reviewed internationally recognised journals.

Courses

The doctoral student shall have completed courses of at least 60 credits, of which 45 credits must be at third-cycle level and no more than 10 credits can be at first-cycle level.

Degree of Licentiate

A Degree of Licentiate comprises at least 120 credits. At least 60 credits must consist of the academic thesis.

Thesis

Quality requirements and possible other requirements for the licentiate thesis.

The purpose of the thesis is for the doctoral student to develop an ability to make independent contributions to the research and an ability for scientific cooperation, within and outside his/her own subject.

The thesis must thus be based on independent research. The doctoral student's contribution to texts included in the essay that have several authors must be distinguishable.

The thesis can take the form either of a compilation of scientific articles or of a monograph essay. In the former case there must be a specially authored summary, known as a kappa. Irrespective of whether the essay is intended to become a monograph or a compilation essay, international publication of results obtained must be aimed for during the study programme period. The essay is normally written in English.

Irrespective of whether it is presented as a monograph or as a compilation of scientific articles, an essay must be of such quality that it is assessed as being capable of forming the basis for at least two articles that can be published in peer-reviewed internationally recognised journals

Courses

The doctoral student shall have completed courses of at least 30 credits, of which 15 credits must be at third-cycle level and no more than 10 credits can be at first-cycle level

1.4.6 Other elements in the education to promote and ensure goal fulfilment

Doctoral students in the subject of historical studies of technology, science and environment are expected to participate in the department's higher seminar, where research is discussed and presented by colleagues and where the doctoral student both broadens his/her knowledge and is trained in the ability to comment constructively on the research of others. The doctoral students must present their own research at the department's higher seminar on at least three occasions and with three different texts. A thesis memo must be presented within one year after admission. A mid-point seminar must be held when half the doctoral thesis is deemed to be complete. A final seminar must be held when at least 80 percent of the doctoral thesis has been written. On the last two occasions mentioned, an external reviewer must lead the review and discussion of the text. Anyone wishing to obtain a Licentiate Degree will conduct a licentiate seminar instead of a mid-point seminar.

2 Admission to education at third-cycle level (qualification etc.)

Admission to education at third-cycle level is regulated in Chapter 7, Section 40 of the Higher Education Ordinance and in the admission regulations at KTH. KTH's regulations on specific prerequisites and such abilities in other respects as are needed to assimilate the education in the relevant subject at the doctoral level are set out below.

2.1 Specific prerequisites

To be admitted to the third-cycle education in **History of Science, Technology and Environment**, the applicant must have passed courses resulting in at least 60 credits at minimum second-cycle level in **in historical subjects or other subjects in the humanities or social sciences deemed relevant** to the chosen specialisation. These entry requirements can be also be considered fulfilled by an applicant who has acquired essentially equivalent knowledge in arrangement.

In order to be admitted to third-cycle education in Computer Science, the applicant must have knowledge of English equivalent to English 6.

2.2 Assessment criteria for testing the ability to assimilate the education

The following assessment criteria apply for testing the ability to assimilate the education:

Selection for third-cycle education is based on assessed ability to assimilate such education. The ability assessment is primarily based on having passed courses and programmes that satisfy the entry requirements. Particular consideration is given to the following:

1. Knowledge and skills relevant for thesis work and the subject.
These can be shown through attached documents and a possible interview
2. Assessed ability to work independently
 - a. ability to formulate and tackle scientific problems
 - b. ability to communicate well in speech and writing
 - c. maturity, judgement and ability to analyse critically and independently

The assessment may be based, for example, on degree projects and discussion of these at a possible interview.

3. Other experience relevant for third-cycle education, e.g. professional experience.
These can be demonstrated through attached documents and, potentially, an interview.

3 The other regulations needed

3.1 Transitional regulations

Doctoral students who have been admitted to a previous subject syllabus are entitled to follow either the new syllabus or the syllabus to which they have been admitted. Requests for change to a new syllabus should be made to the Director of Third-Cycle Education at the school. Changing general syllabus necessitates the requirements for the new syllabus being attainable in the specified time.

