



## General syllabus for third-cycle education in the third-cycle subject area Applied Health Technology

### **1 Description of the third-cycle subject area at BTH**

Within the subject Applied Health Technology, health from an individual perspective and/or population perspective can be directly and indirectly related to the application of the technology and its consequences is studied. The relationship between health and technology is studied from a transdisciplinary perspective. The transdisciplinary nature of the subject allows the research to highlight applications of technology in the field of health from a variety of perspectives and approaches. Research students in the subject can thus start relatively more from a health science perspective and have their background in, for example, nursing, public health science or health economics, or start relatively more from an engineering science perspective and have their background in, for example, mechanical engineering, electrical engineering, or interaction design. The specific focus combination of the research in the individual case is described in the individual study plan.

### **2 Structure of the course/programme**

Third-cycle courses and study programmes which finish with a Degree of Licentiate comprise an actual period of study of two years (120 higher education credits) and consist of a course component of at least 30 higher education credits and a licentiate thesis of at least 60 higher education credits.

Third-cycle courses and study programmes which finish with a Degree of Doctor comprise an actual period of study of four years (240 higher education credits) and consist of a course component of at least 60 higher education credits and a dissertation of at least 120 higher education credits.

A third-cycle student who is admitted to the Degree of Doctor is given the possibility to take a Degree of Licentiate (according to the above) after having completed minimum 120 higher education credits of the programme that is to be finished with a Degree of Doctor.

For each third-cycle student an individual study plan is set up. The individual study plan describes the individual set-up of the studies. The individual study plan is revised and followed up yearly in accordance with the routines that are established at BTH. The study plan is to show in a convincing way how the goals for the third-cycle student's studies can be attained within the available time.

The doctoral programme in Applied Health Technology has a transdisciplinary approach. When compiling the supervisor group, competencies with the different subjects required for the implementation of the thesis work shall be sought.



In accordance with the Higher Education Ordinance at least two supervisors are appointed for each third-cycle student of whom one is appointed principal supervisor. According to the Higher Education Ordinance, an examiner must also be appointed to each doctoral student for assessment and grading in doctoral education. The supervisors and the examiner will be appointed according to BTH's guidelines. The supervisor, who is not the main supervisor of the two, must have a PhD. In addition, further supervisors may be affiliated to the third-cycle student, e.g., from industry, if this is for the benefit of the third-cycle student's studies. For these additional supervisors there is no demand on having a doctoral degree.

## **2.1 Purpose of the education**

BTH conducts third-cycle education to contribute with solutions to the complex challenges in society and to meet the demands of a changeable labour market.

Specifically, the third-cycle courses and study programmes aim at developing the third-cycle student's knowledge in the subject area and her/his capacity to independently carry-on research-, development-, teaching- and investigatory work based on a scientific foundation in different areas of society. The purpose of the Degree of Doctor is, in addition, to give the third-cycle student the capacity to plan, initiate, and lead such work critically and independently.

Specifically, graduate-level education in Applied Health Technology aims to develop the individual's creativity and critical thinking skills as well as the ability to identify, formulate, treat, solve and present scientific problems at the intersection of health and technology. The doctoral education shall meet the individual's need for scientific deepening and critical knowledge seeking and shall prepare for senior positions in research, development and educational activities in health care, college/university or society.

During the programme, the doctoral student will develop the ability to plan and lead research and development work and discuss scientific problems with research colleagues within and outside the country. The doctoral student should develop his/her ability to evaluate and relate to the ethics and values that exist in both the field of technology and health and research within them.

## **2.2 Goals for the education**

According to the System of Qualifications in the Higher Education Ordinance (1993:100) according to enclosure.

In addition to the objectives of the degree scheme in the Higher Education Ordinance (1993:100) as set out in the appendix, the doctoral student in doctoral education in Applied Health Technology shall, after completing his studies, be able to:

1. demonstrate familiarity with engineering thinking, problem solving, terminology and process when using technology in the field of health.
2. demonstrate knowledge of the concept of health and understanding of how health models and theories are applied and developed, with a particular focus on a technical context, as well as knowledge and understanding of people's needs and health.



3. demonstrate familiarity in research methodology, the scientific theoretical basis of the methods and how they can be applied within the research subject Applied Health Technology.

### **2.3 Realization of the education**

The third-cycle student carries on research and writes a scientific work (licentiate thesis/doctoral dissertation). In support of this, the education may include lectures, seminars, literature studies, project assignments, group supervision and individual supervision. Courses for each third-cycle student are established individually in consultation with the supervisors and the examiner and are entered into the individual study plan.

The supervision of the education aims at assisting the third-cycle student regarding choice of research domain, scientific method and organization and planning of the scientific work and pertaining studies. The supervisors are to assist with subject competence and see to that the work holds an international quality level. Furthermore, the supervision aims at introducing the third-cycle student to the scientific community and its demands on, e.g., ethics, honesty and critical thinking.

The third-cycle student is to participate in national and international contexts and present her/his own research.

During the education period, the third-cycle student is to take part of the scientific activities which are conducted in the scientific environment at the department/faculty by attending seminars and guest lectures, and, in the normal case, give one seminar per year about her/his thesis work.

The research student should conduct an oral popular science presentation of his/her research before the licentiate degree and dissertation and write a popular science summary to be inserted into the licentiate thesis and doctoral thesis, respectively.

The research student should present his/her work on the thesis at two or three seminars:

1. Planning seminar and research proposal – the intended research direction (planning of the structure of the thesis/thesis) is reported at an open seminar
2. Mid-term control – after about half the training period, a seminar is held to check that learning outcomes for doctoral education are well on their way to being realized and assess the possibility of the project leading up to a doctoral degree
3. Final seminar and thesis manuscript – no later than 12 weeks before the planned dissertation, a preliminary version of the thesis must be reviewed and presented at an open seminar

In the case of a licentiate degree, half-time control is carried out.

A third-cycle student, employed by the higher education institution as a doctoral student, is recommended to dedicate certain time (not more than 20 per cent of full working hours) to



teaching in first- and second-cycle courses and programmes. Such work is financed by the first- and second-cycle courses and programmes and is to be accounted for in the individual study plan.

The education should be organized so that the third-cycle student attains the stipulated qualitative targets. How the knowledge needs of each individual third-cycle student are to be fulfilled to attain the qualitative targets is stated in respective individual study plan.

### **3 Entry requirements and selection**

#### **3.1 General entry requirements**

According to 7 Chap. 39 § in the Higher Education Ordinance (1993:100).

#### **3.2 Selection**

According to 7 Chap. 41 § in the Higher Education Ordinance (1993:100) and the current admission regulations at BTH. Selection is to be made in consideration of the applicants' capacity to profit by the education. The foundation for selection among the qualified applicants is the degree of capacity to profit by the third-cycle education, and the access to supervision and other resources in view of the planned specialization of the licentiate thesis/doctoral dissertation.

Examples of bases of assessment applied at the selection for third-cycle education are constituted by:

- Familiarity with the theory and applications of the subject,
- Relevant work experience where appropriate.
- Ability to express oneself in speech and writing,
- Familiarity with English,
- Creativity, initiative, independence, and ability of cooperation.

To assess how the applicant fulfils the bases of assessment, the following are used: results from higher education courses, quality of the independent work and possible publications, references, interviews, possible personal knowledge, and a personal letter from the applicant which describes the applicant's expectations on and intentions with the education. In certain cases, the applicant may undergo specific work tests. Preference is given to applicants whose specialization fits within the research subject's development strategy and research projects.

Admission to third-cycle education is done on a continuous basis.

### **4 Examinations that form part of the education**

The education consists of courses and a scientific work. Examinations that form part of the third-cycle education are assessed with the grades pass/failed. A grade on a course and a licentiate thesis, respectively, is determined by a specially appointed examiner. A grade on a doctoral dissertation is determined by a specially appointed grading committee.



For a possible credit transfer, see the current order for credit transfers and the guidelines for credit transfers.

#### **4.1 Courses**

In support of the research work and for the fulfilment of the qualitative targets generally, the third-cycle student studies several courses. Courses completed at BTH as well as courses from other higher education institutions can be included.

For third-cycle courses given at BTH there is to be a written course description which, among other things, states the title of the course in Swedish and English, the course objectives, content and credits. The individual study plan is to regulate which courses can form part of the studies and how many higher education credits each course should award (for participation in a course originally intended for first- or second cycle, see the guidelines for credit transfer of courses in third-cycle education).

Doctoral students who are expected to teach within the position must complete at least 3 credits in higher education pedagogy.

Components of the education in the areas below are compulsory. How these are examined, through a course or other component, is regulated in each separate individual study plan.

- Research methodology
- Information search for researchers
- Scientific writing and scientific review
- Ethics in research

In addition to these courses, the doctoral student should complete profile courses in Applied Health Technology of 15–30 credits depending on prior knowledge, where 7,5 credits constitute the compulsory seminar series in Applied Health Technology.

The choice of courses is to be characterized by flexibility about the third-cycle student's prior knowledge and the specialization of the research work and is to be determined in consultation between the third-cycle student, supervisors and examiner. The examination format is determined by the examiner in consultation with the supervisors. Goal attainment is tested by the examiner.

All compulsory courses or components are to be completed before the doctoral dissertation is publicly defended at the public defence of the doctoral dissertation. Other courses and components are to be chosen so that the third-cycle student obtains both breadth and depth in the research domain. The courses are also to benefit the third-cycle student's competence and skills, her/his studies, or scientific work.

#### **4.2 Scientific work**

Scientific work in the form of a licentiate thesis/doctoral dissertation is to be designed as an integrated, connected scientific work (monograph) or as a summary – introductory part –



together with pertaining scientific academic papers (compilation), which the third-cycle student has written alone or together with another person or persons. The scientific work is written in English or Swedish.

The licentiate thesis is to be presented orally at a public licentiate seminar. For further information, see "Rules for licentiate seminars" established by BTH.

The doctoral thesis must be defended orally at a public defence. The thesis must previously have been quality assured according to the description in "Appendix – Quality assurance of doctoral thesis" For further information, please refer to the "Rules for defending a doctoral thesis" established by the university.

## **5 Degree**

### **5.1 Qualitative targets**

Goals according to the System of qualifications in the Higher Education Ordinance (1993:100) according to "Enclosure – System of qualifications (Higher Education Ordinance 1993:100)".

### **5.2 Title of qualification**

The degree title of third-cycle studies in Swedish at BTH consists of a general degree with the addition of a prefix.

Doctoral students who complete a licentiate degree in Applied Health Technology who have a technical qualification for education normally receive the degree title Degree of Licentiate of Technology. In other cases, the degree title of licentiate degree is obtained (eng. Degree of Licentiate of Philosophy).

Doctoral students who complete a PhD in Applied Health Technology who have a technical qualification for education normally receive the degree title Degree of Doctor of Philosophy. In other cases, the degree of Doctor of Philosophy is awarded the title of Doctor of Philosophy.

## **6 Effective date and interim regulations**

This general syllabus becomes effective on June 1, 2021.

Third-cycle students admitted before June 1, 2021, will complete, as a general rule, their studies according to the older general syllabus. If a third-cycle student so requests and it is deemed suitable, the relevant examiner may accept a transfer to the new general syllabus. The third-cycle student will then report the transfer to the relevant Dean and attach a copy of an updated individual study plan updated according to the new general syllabus.



## Enclosure I – Quality assurance of a doctoral thesis within the third-cycle subject Applied Health Technology

The preliminary assessment means that the opponent and ordinary members of the examination board must each assess whether the thesis is of sufficient quality to be approved as part of a Swedish doctoral degree and thus considered ready to be presented for dissertation, and if this is not the case, justify their judgment. A positive pre-assessment does not exclude a different assessment after the dissertation.

1. The pre-assessment shall be carried out by the decided opponent and decided ordinary members of the examination board and after the final seminar has been conducted (see the subject's general study plan). The pre-evaluation should be completed no later than six weeks before the agreed date of the dissertation. A pre-assessment is expected to take approximately two weeks and the thesis manuscript, including included articles, must therefore be sent for pre-assessment no later than eight weeks before the dissertation.
2. If the opponent or member of the examining committee is replaced late in the process, the replacement does not need to assess the thesis in advance.
3. Answers are sent in the form of a completed preview form (see below) by e-mail to the main supervisor. If an appraiser does not respond, despite a reminder, it is interpreted as a positive judgment.
4. A positive opinion need not be followed by any reasoning or comments. However, a negative opinion should be followed by a justification.
5. If one or more assessors find that the thesis is not suitable for presentation for a dissertation, the dissertation should be postponed. However, the doctoral student has the right to still present the thesis for dissertation according to the original plan.
6. The main supervisor is responsible for ensuring that the ex-ante evaluation is carried out in accordance with these guidelines.



Form for pre-assessment of doctoral thesis within the third-cycle subject  
Applied Health Technology at BTH

**Research student's name**

--

**Preliminary title of the thesis**

--

**Opinion**

I believe that the thesis is of such quality that it can be approved as part of a Swedish doctoral degree and that it is therefore appropriate that it be presented for dissertation

I do not believe that the thesis is of such quality that it can be approved as part of a Swedish doctoral degree and that it is therefore inappropriate for it to be presented for a dissertation

*In case of dissuasion, please justify below.*

**Motivation:**

--

**Signature**

**Name:**

--

**Date:**

**Signature:**

--	--





## Enclosure – System of qualifications (Higher Education Ordinance 1993:100)

### **Degree of Licentiate**

#### **Scope**

A Degree of Licentiate is awarded

either after a third-cycle student has completed a study programme of at least 120 credits in a subject in which third-cycle teaching is offered,

or after a third-cycle student has completed one part comprising at least 120 credits of a study programme intended to conclude with the award of a PhD, if a higher education institution decides that a Degree of Licentiate of this kind may be awarded at the institution.

#### **Outcomes**

##### **Knowledge and understanding**

For a Degree of Licentiate the third-cycle 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 of research in particular.

##### **Competence and skills**

For a Degree of Licentiate the third-cycle 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
- demonstrate the ability in both national and international contexts to present and discuss research and research findings in speech and writing and in dialogue with the academic community and society in general, and
- demonstrate the skills required to participate autonomously in research and development work and to work autonomously in some other qualified capacity.

##### **Judgement and approach**

For a Degree of Licentiate the third-cycle student shall

- demonstrate the ability to make assessments of ethical aspects of his or her own research
- demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used, and



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

### **Thesis**

For a Degree of Licentiate the third-cycle student shall have been awarded a pass grade for a research thesis of at least 60 credits.

### **Miscellaneous**

Specific requirements determined by each higher education institution itself within the parameters of the requirements laid down in this qualification descriptor shall also apply for a Degree of Licentiate with a defined specialisation.

### **Degree of Doctor**

#### **Scope**

A Degree of Doctor is awarded after the third-cycle student has completed a study programme of 240 credits in a subject in which third-cycle teaching is offered.

#### **Outcomes**

##### **Knowledge and understanding**

For the Degree of Doctor the third-cycle student shall

- demonstrate broad knowledge and systematic understanding of the research field as well as advanced and up-to-date specialised knowledge in a limited area of this field, and
- demonstrate familiarity with research methodology in general and the methods of the specific field of research in particular.

##### **Competence and skills**

For the Degree of Doctor the third-cycle 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
- 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
- demonstrate through a dissertation the ability to make a significant contribution to the formation of knowledge through his or her own research



- 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
- demonstrate the ability to identify the need for further knowledge and
- 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.

### **Judgement and approach**

For the Degree of Doctor the third-cycle student shall

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

### **Research thesis (doctoral thesis)**

For the Degree of Doctor the third-cycle student shall have been awarded a pass grade for a research thesis (doctoral thesis) of at least 120 credits.

### **Miscellaneous**

Specific requirements determined by each higher education institution itself within the parameters of the requirements laid down in this qualification descriptor shall also apply for a Degree of Doctor with a defined specialisation.