



UNIVERSITY
OF BORÅS

GENERAL SYLLABUS

Reg. no.: 673-24

General Syllabus for Doctoral Studies in Textile Technology

Published	University policy document
Type of university policy document	General syllabus
Decision-maker	The Research and Education Board
Decision support	Chapter 5, Section 5 of the Board's Organisational and Decision-Making Procedure
Decision date	2024-10-24
Version	4

General Syllabus for Doctoral Studies in Textile Technology

Area description

The doctoral subject area of *Textile Technology* is one of three subjects in the research area *Textiles and Fashion*. The area of Textiles and Fashion examines definitions, methods, and models of importance for the development and application of textiles and fashion in research, industry, and society at large. In this area, the connections between material and design variables for function and expression in the development and production of textiles and fashion are studied, as well as the relationship between economic and design variables (resources) for function and expression in the production, distribution, and trade of textiles and fashion.

The doctoral subject Textile Technology is multidisciplinary in nature and combines different scientific disciplines with many application areas. Textile materials range from well-known applications in clothing and interior design to advanced technical products. Research in textile technology at the University of Borås is therefore characterised by the use of different technologies for socially and industry-relevant applications where typically advanced and smart materials and new processes are central themes.

The research follows the textile value chain and includes natural and synthetic fibres, yarn spinning, weaving, knitting, textile composites, coating, printing, dyeing, 3D structures, 3D design, recycling, textile systems and integrates surface science, polymer technology, (bio)catalysis, biotechnology, chemistry, digital technologies (inkjet, 2D and 3D printing), nanotechnology, electronics, sensors, and photonics. In addition, there is a focus on new, innovative processes for the production of such advanced textile materials and products with, for example, artificial intelligence (AI), virtual reality and digitalisation.

Textile Technology also addresses the challenge of minimising the ecological and societal footprint in the production, use, and disposal of textiles by considering all steps in the value chain to enable circular flows. Everything from the production of raw materials for fibres, filaments, auxiliaries, preparations, dyeing, coatings, printing, and functionalising chemicals, combinations of intermediate and final treatments, as well as laminations are considered to identify successful strategies that minimise the ecological and societal footprint along the textile value chain.

The University of Borås also conducts research in textile technology focused on fibres and textiles from renewable raw material resources, as well as the reuse of fibres via chemical, mechanical, physicochemical, and biotechnological process pathways.

Purpose of the doctoral programmes in Textiles and Fashion

The overall aim of the doctoral programmes in Textiles and Fashion is to contribute to societal development and success in the textile sector by educating doctoral-level academics for positions in business and industry, academia, and society. A Doctor of Philosophy in Science or a Doctor of Philosophy and Licentiate in Textile Technology is characterised by in-depth knowledge of new, advanced smart/functional textile materials and their applications. They have also developed an approach to material development and material use that is sustainable in a longer perspective, both from an environmental and a social perspective.

The doctoral programme in Textile Technology aims to develop:

- the ability to work scientifically, to problem-solve, and to think critically

- the doctoral student's personal competence and communication skills,
- an interest in and knowledge of innovations and entrepreneurship,
- the doctoral student's teaching ability, and
- a network, both nationally and internationally.

In order to achieve these qualities, collaboration and communication within and outside academia are central. The doctoral programme in Textile Technology is located at the Textile Fashion Center, which provides proximity to, and enables collaboration with, a number of different actors in research, education, and innovation. Furthermore, the doctoral programme in Textile Technology means:

- the doctoral student works in projects together with other researchers, and participates in the group's presentations to external stakeholders,
- the doctoral student presents their work at research conferences, and can also participate in trade fairs such as Techtexil, and
- The doctoral student is given the opportunity to spend time in an international research environment for shorter or longer periods.

Objectives for general doctoral level degrees

Intended learning outcomes for general doctoral level (third-cycle) qualifications are stated in the Higher Education Ordinance and are regulated in Chapter 6 of the Higher Education Ordinance § 26-27. These can be found in the appendix.

How the programme is organised

Overview

Doctoral education in Textile Technology that concludes with a Degree of Licentiate comprises 120 ECTS, which corresponds to two years of full-time study. This programme consists of a course component of 40 ECTS and a licentiate thesis of 80 ECTS. A Degree of Licentiate can be a sub-goal in a doctoral degree.

Doctoral education in Textile Technology that concludes with a Degree of Doctor comprises 240 ECTS, which corresponds to four years of full-time study. This programme consists of a course component of 60 ECTS and a thesis of 180 ECTS.

As an intermediate goal for the doctoral degree, there is a requirement to complete the midway review (*mittseminarium*) and the final review (*slutseminarium*).

Supervisors and examiners

Each doctoral student is to be appointed a principal supervisor (*huvudhandledare*) and one or more assistant supervisors (*biträdande handledare*). The principal supervisor must have reached the merit of associate professor (*docent*), be active in a relevant field, and be lasting affiliated with the University of Borås. The assistant supervisor(s) must hold a doctoral degree, or if from outside academia, have equivalent validated expert knowledge. The principal supervisor must have completed supervisor training at the University of Borås, or have documented, equivalent, competence.

Supervisors are appointed by the R&D Board's Research Education Committee upon the proposal of the Director of Studies, who prepares the documentation for this. The principal supervisor is to be proposed with regard to the doctoral student's project and/or subject

specialisation, and appointment is to take place in connection with their admission to the programme. An assistant supervisor is to typically be appointed at the same time as the principal supervisor, but if there are reasonable reasons for postponement, for instance a need to discuss what skills are needed, the committee can approve this.

Doctoral students always have the right to change one or more supervisors. The Director of Studies is to assist a doctoral student who wants to initiate a change. How this is done is regulated in accordance with the policy document decided by the Vice-Chancellor.

Together, the supervisors form the doctoral student's supervisor group, where the principal supervisor is responsible for supervision and quality within the framework of the doctoral thesis work. The principal supervisor is also responsible for ensuring:

- a) the doctoral student receives sufficient supervision, and
- b) the timetable for the various components of the programme follows the plan established in the doctoral student's individual study plan (ISP).

Exceptions to stipulated requirements for principal supervisors may be made in cases where the doctoral student is funded by a party outside of higher education, for example a doctoral student employed at another university or by a company.

The R&D Board's Research Education Committee for Engineering and Technology (FUU-TEKN-NA) is to decide on an examiner for doctoral students. The academic examiner must be at least an associate professor in the subject and must have several years of experience in research in textile technology or related subjects and be employed at the University of Borås. The examiner has overall responsibility for the doctoral student's research education and must ensure that the education meets the quality requirements.

Individual study plan

For each doctoral student, an individual study plan (ISP) is drawn up.

Doctoral students' ISPs are established by the doctoral student and supervisor group jointly, with the support of the Director of Studies. Overall, the ISP contains descriptions of the doctoral student's projects and planned activities (for instance courses, conferences, and major lab work) as well as documentation of results (for instance published articles and conference papers). Overall, the doctoral student's ISP must provide an adequate description of their progression regarding both the progress of the research project and their own development in line with the intended learning outcomes of the education. Doctoral students' progression in relation to the intended learning outcomes is documented on an ongoing basis in connection with the follow-up of the ISP.

A first version of the doctoral student's ISP must be prepared and approved by the R&D Board's FUU-TEKNNA within three months of the doctoral student's admission. The ISP must then be followed up on an ongoing basis. Updated ISPs are established by the R&D Board's FUU-TEKN-NA on an annual basis, as well as in the event of major changes in the doctoral student's education, such as for instance replacement of the principal supervisor or changes in the pace of study. Deviations from the plan that delay the doctoral student's work must be commented on by the principal supervisor, and it is the principal supervisor's responsibility, with the support of the Director of Studies, to propose measures to keep to the specified timetable.

Coursework

Doctoral studies in Textile Technology that culminate in a doctoral degree consist of a course component of at least 60 ECTS, while a licentiate degree consists of a course component of at

least 40 ECTS. In the education up to the licentiate degree, the focus is primarily on methodological and subject knowledge in the area in which the scientific work is included. The licentiate degree also includes course components in theory of knowledge and research ethics, and the doctoral students are trained in a critical approaches and scientific communication through course seminars and conference participation. In the latter part of the programme, the focus is on the development of research questions and theory within the theme of the scientific work, and the doctoral student further develops their ability to analyse and take a critical approach. Here, doctoral students can also choose to develop their competence in subjects such as higher education pedagogy through the range of general courses at the doctoral level offered at UB.

Which courses are to be included in the doctoral student's education is planned individually and depends on their background knowledge and specific needs. The doctoral student's ISP states the courses that are to be or may be included in their education, as well as how many ECTS each course is to be counted as. The composition of courses is determined by the appointed examiner for the doctoral student. Courses at the doctoral level in the following subject areas are compulsory:

For Degree of Licentiate

Skills courses

- Course in Theory of Science, at least 5 ECTS.
- Course in Research Ethics, at least 2.5 ECTS.
- Course in Quantitative Methods, at least 7.5 ECTS.

Subject courses (Textile Technology)

- At least 15 ECTS

Elective courses

- Corresponding to 10 ECTS

For Degree of Doctor

In addition to the courses included in the licentiate degree, there are also skills and subject-related courses, corresponding to 20 ECTS

Deviations from the compulsory courses can be made within the framework of educational collaborations or if special reasons exist. The examiner is responsible for the composition and suitability of the doctoral student's course package. Current course offerings are posted on the university's website for doctoral education. In cases where course components are provided at the University of Borås, the student is encouraged to take the course on site. Doctoral students can also take courses at another university.

Credit transfer from previous education

A doctoral student who has completed part of their doctoral education in the same or a related relevant subject at a Swedish higher education institution with a passing grade may be credited for all or part of it. A doctoral student may also be granted the right to transfer ECTS from a foreign educational institution. Questions concerning credit transfer of previous education are addressed by the Director of Studies and a decision is made to appoint the examiner for the doctoral students. A decision on credit transfer is made in connection with the assessment of the first version of the doctoral student's ISP. Previous studies that are to be transferred towards commenced doctoral studies are listed there under their own heading.

Inclusion of ECTS from the Master's level

Doctoral students can also receive credit transfer for courses at the Master's level (second-cycle). The doctoral student's appointed examiner is to examine both the suitability of including the relevant course from the Master's level and the proposed scope of course credits. For the doctoral programme in Textile Technology, a maximum of 15 ECTS may be credited from the Master's level.

Course examiner

For courses that are part of the doctoral student's education, there must be an appointed course examiner, as well as an established written course syllabus or equivalent documentation. Professors and other docent-level (Associate Professor) qualified teaching staff who are active in a relevant field and lasting affiliated with the University of Borås may be appointed as doctoral programme examiners in Textile Technology.

Scholarly work

The programme includes scholarly work documented in a licentiate thesis of 80 ECTS and a doctoral thesis of 180 ECTS. If the licentiate thesis is an intermediate goal, the equivalent of 80 ECTS is included in the 180 ECTS required for the doctoral thesis.

Licentiate thesis

Within the framework of a doctoral education, a licentiate thesis can be named as an intermediate goal or as a final goal. The licentiate thesis must be designed either as a compilation thesis or a coherent, unified work in the form of a monograph thesis. In a monograph thesis, the thesis must have been reviewed by a person competent to supervise (via "*grönläsning*") (also known as the "green light" committee) before it can be presented at a seminar. This person may not be the doctoral student's examiner or supervisor.

In the case of a compilation thesis, the academic articles must be of such quality that they can be published in scientific journals and the doctoral student's contribution must be distinguishable and independent. Typically, at least two articles should be included in the thesis. At least half of the articles must have been published or accepted for publication in academic journals at the time of the seminar. If this is not the case, the paper must have been reviewed by a person competent to supervise (via "*grönläsning*") or also known as the "green light" committee) before it can be presented at a seminar. This person may not be the doctoral student's examiner or supervisor.

The licentiate thesis and the research work carried out must be presented at a public seminar where the time and place are announced at least three weeks in advance. During this time, the thesis must be available for review at the university. Grades (pass or fail) are determined by an examiner appointed by the R&D Board's FUU-TEKN-NA. Professors and other Associate Professor-level teaching staff who are lasting linked to the university may be appointed examiners for licentiate theses. There are two reviewers at the Licentiate Seminar, one of whom has at least a doctoral degree and the other Associate Professor-level or higher, at least one of whom is recruited from outside the own research group.

Doctoral Thesis

The doctoral thesis must either be designed as a monograph thesis, i.e. a uniform, coherent scholarly work, or as a compilation thesis. In a monograph thesis, the thesis must have been reviewed by two people competent to supervise (via "*grönläsning*") or internal examination, also

known as the “green light” committee) before it can be presented for public defence. These people may not be the doctoral student's examiner or supervisor.

In the case of a compilation thesis, the scientific articles must be of such quality that they can be published in scientific journals and the doctoral student's contribution must be distinguishable and independent. Typically, at least four articles must be included in the thesis. Of the articles, at least half must have been published or accepted for publication in scientific journals at the time of the public defence. If this is not the case, the thesis must have been reviewed by two people competent to supervise (via “*grönläsning*” or internal examination, also known as the “green light” committee) before it can be presented for public defence. These people may not be the doctoral student's examiner or supervisor.

The doctoral thesis must be defended at a public defence, instructions for preparation and implementation are described in *Guidelines for doctoral thesis defences at the University of Borås*. The grade (pass or fail) for the doctoral thesis is determined by an examining committee, and the board's decision is announced after deliberation in connection with the public defence. The examining committee is appointed by FUU TEKN - NA before each public defence in accordance with the university's *Guidelines for public defence implementation*.

At least three months before the planned public defence, the main results of the thesis work must be discussed at a final review. Doctoral students who do not submit a licentiate thesis must, in addition to the final seminar, also present their ongoing thesis work for review at a midway review. Reviewers of the doctoral student's work at both the midway review and final review are appointed by the R&D Board's R&D, based on the proposal of the doctoral student's supervisor. A doctoral student in the same subject may be appointed as an assistant reviewer.

Entry requirements, selection, and admission

General entry requirements

To meet the general entry requirements for doctoral studies, the applicant must have:

- 1) been awarded a Master's level (second-cycle) qualification
- 2) satisfied the requirements for courses comprising at least 240 ECTS of which at least 60 ECTS were awarded in the Master's level (second-cycle), or
- 3) acquired substantially equivalent knowledge in some other way in Sweden or abroad.

Through FUU-TEKN-NA, the university may grant an individual applicant an exemption from the general entry requirements, if there are special reasons, HF 7:39 (2010:1064). See UB's local *Guidelines for admission regulations for doctoral studies*.

Specific entry requirements

Specific entry requirements for doctoral studies in Textile Technology at the University of Borås are as follows: The applicant's degree must have a specialisation that has a sufficient connection to the subject area of the doctoral studies (third-cycle). It is the responsibility of the R&D Board's FUU-TEKN-NA to review that the applicant has the skills needed to complete the doctoral education.

Applicants from abroad, who do not have English or a Scandinavian language as their mother tongue, should typically undergo an English language test (e.g. TOEFL 575 (paper-based) or TOEFL 100 (internet-based) before admission.

Selection and admission

Selection for doctoral studies takes place on the basis of an assessment of the ability to benefit from the same. The R&D Board's FUU-TEKN-NA appoints an assessment panel for each recruitment. Assessment is made on the basis of the application documents received and interviews with the most qualified applicants. Gender aspects should also be taken into account.

Assessment of the ability to benefit from the education is primarily based on study results at from the Bachelor's and Master's level (first- and second-cycle levels). In this regard, particular consideration is to be given to the following:

- Knowledge and skills relevant to the subject of study and the thesis work.
- Assessed capacity to work independently. Such an assessment can be made during the interview by discussing the applicant's implementation and experiences from a degree project or another project attached to the application.
- Proficiency in verbal and written communication in English and Swedish.
- Other experience relevant to the doctoral education, such as professional experience.

However, the mere fact that an applicant is deemed to be able to have previous education or professional activity credited in the education may not give the applicant priority over other applicants in the selection process Hf7:41 (2010:2064). Otherwise, admission of doctoral students follows the university's local guidelines for admission regulations for doctoral education.

Qualification requirements

Doctoral education concludes with a doctoral degree or, if the doctoral student so wishes or this has been stated in the admission decision, with a licentiate degree. The doctoral student also has the right, but not the obligation, to complete a licentiate degree as a stage in their doctoral education.

A Degree of Licentiate requires:

- Approved courses of at least 40 ECTS
- Approved scientific thesis the scope of which corresponds to studies of at least 80 ECTS, and which has been defended at a public seminar.

A Degree of Doctor requires:

- Passed courses of at least 60 ECTS
- Approved thesis the scope of which corresponds to studies of at least 180 ECTS, and which has been defended at a public defence.

Examinations that are part of doctoral (third-cycle) education are to be assessed with one of the grades Pass or Fail.

Degree title

For doctoral studies in the doctoral (third-cycle) subject of Textile Technology, there are four degrees:

- Degree of Doctor of Philosophy in Textile Technology (Teknologie doktorsexamen i Textilteknologi)
- Degree of Licentiate in Textile Technology (Teknologie licentiatexamen i Textilteknologi)

- Degree of Doctor of Philosophy in Textile Technology (Filosofie doktorsexamen i Textilteknologi)
- Degree of Licentiate in Textile Technology Degree of Licentiate in Textile Technology (Filosofie licentiatexamen i Textilteknologi)

Entry into force and transitional provisions

Previous general syllabus (Reg. no. 929-20) ceases to apply to doctoral students admitted to doctoral studies after 2024-10-24. By agreement between the doctoral student and the supervisor, the present general syllabus may constitute a policy document for doctoral students who have already been admitted. The doctoral student's ISP must state which general syllabus the doctoral student follows.

Other provisions

To the extent that resources are available, doctoral students participate in undergraduate education programmes, for example by supervising, teaching, and assisting in laboratory work. The extent may not exceed 20 per cent of the total time.

In addition, the general provisions for doctoral education laid down by the University of Borås apply, which regulate, for example, employment, approved leave from studies, and general rights for doctoral students. Current regulations are available via www.hb.se

Appendix — general intended learning outcomes

Knowledge and understanding

For a Degree of Licentiate, the doctoral student is to show:

- knowledge and understanding in their field as well as relevant specialist knowledge in a limited part of this.
- in-depth knowledge of scientific methodology in general and the specific research area's methods in particular.

For a Degree of Doctor, the doctoral student is to show:

- broad expertise in and a systematic understanding of their field as well as specialised and up-to-date specialist knowledge in a limited part of this.
- familiarity with scientific methodology in general and with scientific methodology in the field in particular.
- in-depth insight into the critical knowledge needs of the field.

Competence and skills

For a Degree of Licentiate, the doctoral student is to show:

- 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.
- 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.
- the ability to collaborate with professional specialists in the field and such skills as are required to independently participate in research and development work and to work independently in other qualified activities.

For a Degree of Doctor, the doctoral student is to show:

- the ability for scientific analysis and synthesis as well as for independent critical review and assessment of new and complex phenomena, questions, and situations; ability to critically, independently, creatively and with scientific accuracy identify and formulate questions, to plan and with adequate methods conduct research and other qualified tasks within given time frames, and to review and evaluate such work.
- the ability to identify the need for additional knowledge and show abilities, both in research and education as well as in other qualified professional contexts, to contribute to development and support the learning of others.
- the ability in both national and international contexts to authoritatively present and discuss research and research findings in speech and writing and in dialogue with the academic community and society in general.
- the ability to collaborate with professional specialists in the field.
- the ability to contribute significantly to the development of knowledge in their field through their own research with a scholarly thesis.

Judgement and approach

For a Degree of Licentiate, the doctoral student is to show:

- the ability to make assessments of ethical aspects of their own research.
- insight into the possibilities and limitations of research, its role in society, and the responsibility of the individual for how it is used.
- understanding of and ability to participate in multidisciplinary collaboration.

For a Degree of Doctor, the doctoral student is to show:

- intellectual autonomy and disciplinary rectitude as well as the ability to make assessments of research ethics.
- specialised insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used.
- understanding of and ability to participate in multidisciplinary collaboration.