



Textile Production and Innovation

Textil produktion och innovation

180 credits

Ladok Code: TGTPI

Version: 3.1

Level: First cycle

Approved by: Committee for Education in Technology 2024-10-04

Valid from: Autumn 2025

Valid for: Admitted autumn 2025

General Objectives

First level education shall develop the students'

- ability to make independent and critical assessments,
- ability to independently perceive, formulate and solve problems, and
- preparedness to deal with change in working life.

In the educational field concerned, in addition to knowledge and skills, students shall develop an ability to

- seek and evaluate knowledge at a scholarly level,
- follow the development of knowledge, and
- exchange knowledge with other people, including people without specialist knowledge of the field

(The Higher Education Act, Chapter 1, Section 8)

Objectives

The education provides the student with knowledge and skills to link textile innovation and production. This implies possessing good knowledge within various areas of textile technology to drive innovation through product and process development. The student develops the ability to seek innovative product and production solutions towards various functional and quality requirements while considering sustainable development. The student should also demonstrate well-developed knowledge in innovation and production, with a focus on international manufacturing and digitalization. Theoretical knowledge is combined with practical applications and project work within textile innovation and production. The education promotes and develops the student's learning towards a structured, independent, and analytical work approach while adhering to given timeframes.

For the Bachelor's degree, the student should:

1. Knowledge and Understanding

- 1.1 demonstrate knowledge in and understanding of the scientific foundation of textile technology, established methods, and knowledge of current research and development work,
- 1.2 demonstrate understanding of natural science and its applications within textile technology,
- 1.3 demonstrate knowledge in and understanding of innovation in textile product development and production,
- 1.4 demonstrate in-depth knowledge in and understanding within the program specialization,
- 1.5 demonstrate basic knowledge in project management and understanding of projects as a form of work,
- 1.6 account for research questions and development work within the field, define and process purpose, method, and results in textile technology, as well as account for its scientific foundation.

2. Skills and Abilities

- 2.1 demonstrate the ability to practically apply and independently analyze textile production techniques and evaluation methods in an industrial and laboratory environment, such as handling a selection of software, machinery, and equipment commonly used in the textile industry,

- 2.2 demonstrate the ability to identify, analyze, and manage aspects within innovation, quality, environment, and ethics in the textile value chain at both product and organizational levels,
- 2.3 demonstrate problem-solving ability, initiative, and teamwork in groups with different compositions and from similar disciplines,
- 2.4 demonstrate the ability, with a holistic view, to independently and creatively identify, formulate, and manage issues and analyze and evaluate different technical solutions,
- 2.5 demonstrate the skill to seek information and knowledge; i.e., identify suitable paths, effectively utilize them, and critically evaluate the search results,
- 2.6 demonstrate the ability to communicate through written and oral presentation and through graphic communication.

3. Judgement and Approach

- 3.1 demonstrate the ability to handle textile technology from an interdisciplinary perspective, understanding of the field, considering relevant scientific, ethical, and societal aspects as well as from a sustainable and international perspective.
- 3.2 demonstrate insight into the role of knowledge in society and demonstrate the ability to identify the need for further knowledge to develop one's own competence.

Content

The education comprises three years of full-time studies equivalent to 180 credits, where the main field of Textile Technology is included throughout all years. The education is characterized by many practical courses where theoretical and practical tasks are combined for the best understanding and achievement of objectives. The foundational textile courses in fiber and yarn, knitting, weaving, and nonwoven technology, dyeing and finishing, as well as textile assembly technology and textile product manufacturing, form the basis for the broad textile competence on which the education is built. Innovation is trained from idea to concept in product and process development while considering technical requirements as well as legal requirements. Furthermore, theoretical and practical knowledge is applied in project courses where the student is trained to assemble all parts for a product to be put into production. These products and processes are processed and analyzed from several sustainability perspectives. Students are given the opportunity to specialize within one of two specializations; Material Innovation or Product Innovation. The final independent work (thesis) is written within the chosen specialization. The problem formulation is anchored in the business community or research, and the execution and examination follow the academic requirements for methodology and report writing. The education thus combines industry and academia.

Sustainability

The education highlights several sustainability perspectives concerning products and their development and production. By linking textile processes to their environmental impact and opportunities, a fundamental understanding of sustainability is created. How sustainable products are linked to various legal requirements as well as quality aspects are discussed in several courses. The entire life cycle of products is analyzed and forms the basis for sustainable alternatives in both the development process and the final product.

Digitalization

Digitalization occurs throughout the textile value chain, reflecting the program's approach. Digitalization in textile material production, dyeing and finishing, together with digitalization in product design and manufacturing, will form the basis for knowledge about digital tools, methods, and technologies in production.

Specialization

The program offers the opportunity for two different specializations within the program. Three elective courses in the third year are included in the specialization and correspond to 22.5 credits. The course Textile Innovation (7.5 credits) offered in the second year is included in both specializations Material Innovation and Product Innovation. The final independent work (thesis) comprises 15 credits and is written within the chosen direction. Courses within the specializations may be prerequisites for later courses. The courses are offered subject to sufficient interest.

Writing Process

Throughout the education, the writing process is used to support practical learning. It's not just about writing but includes information retrieval, report writing, and peer review. All three parts are addressed throughout the education, preparing the student to write an academic paper at the end of the education. The initial course introduces writing by keeping a reflective logbook connected to practical laboratory work, establishing a link between the practical and the writing. Information retrieval helps the student find both books and academic papers and correctly reference them. Report writing trains students both in the structure of reports and academic writing. The setup of peer review benefits students' awareness of writing, preparing them to objectively review others' work and provide constructive criticism.

International Mobility

Outbound international mobility is expected during the second year of the program, especially during term 4.

Scientific Method

Throughout the education, the student is trained in a structured, analytical, and critical approach. The student is introduced to how research within their field is conducted and analyzed. This is done throughout all three study years in an integrated manner in several courses with dedicated learning activities such as project-based learning activities. This is then examined by having the student describe their approach in a simple but structured way through a project assignment and then analyze its results and identify improvements for future projects.

In dedicated activities within several courses, the student seeks academic papers, aiming to find new subject knowledge, orient themselves within the subject's methods, and understand academic writing culture. Processing of papers also aims to train students in critical thinking and to compare different sources and engage in discussions about the source material. Students also identify how current research affects society.

Apart from within project activities in the courses, students present a problem formulation and/or research questions and seek knowledge and methods in previous research and development projects. When the thesis is to be conducted, the student has already been introduced to all tools and can therefore focus on the implementation of the work, which is done in collaboration with industry or research. Through this concluding course, the student demonstrates mastery of both carrying out an independent project and communicating its results through a scientific report and a presentation aimed at the general public.

Semester 1

Introduction to Textile Production and Innovation (2.5 credits) Objectives 1.1, 2.5–2.6
Textile Basics (5 credits) - Objectives 1.1, 2.2, 2.5–2.6
Textile Technical Science I (7.5 credits) - Objectives 1.1-1.2
Fiber and Yarn Technology (5 credits) - Objectives 1.1–1.2, 2.1–2.2, 3.1
Weaving Technology (5 credits) - Objectives 1.1, 2.1
Knitting Technology (5 credits) - Objectives 1.1, 2.1

Semester 2

Textile Science II (7.5 credits) - Objectives 1.1–1.2
Technical Textile Product Development (7.5 credits) - Objectives 1.1, 1.3, 2.1–2.5, 3.1
Nonwoven Technology (5 credits) - Objectives 1.1, 2.1–2.2, 2.4–2.5, 3.1
Dyeing and Finishing (5 credits) - Objectives 1.1–1.2, 2.1–2.2, 2.5–2.6, 3.1–3.2
Textile Product Manufacturing (5 credits) - Objectives 1.1, 1.3, 2.1–2.2, 2.5, 3.1

Semester 3

Textile Structures (7.5 credits) - Objectives 1.1–1.3, 2.1, 2.4–2.6, 3.1
Textile Innovation (7.5 credits) - Objectives 1.1, 1.3–1.4, 2.1–2.6, 3.1–3.2
Textile Assembly Techniques (5 credits) - Objectives 1.1, 2.1–2.2, 2.5
Quality Assurance and Textile Testing (5 credits) - Objectives 1.1–1.2, 2.1–2.2, 3.1
Digital Tools for Communication (5 credits) - Objectives 2.1, 2.6

Semester 4

Design Thinking and Rapid Prototyping (7.5 credits) - Objectives 1.1, 1.3, 1.5, 2.1–2.2, 2.6, 3.1
Digital Textile Transformation (7.5 credits) - Objectives 1.1, 1.3, 1.5–1.6, 2.1–2.3, 2.5–2.6, 3.1
Project Management and Global Communication (7.5 credits) - Objectives 1.1, 1.5, 2.2–2.3, 2.5–2.6, 3.1–3.2
Sustainable Business and Product Development (7.5 credits) - Objectives 1.1, 1.5, 2.1, 2.3, 2.5–2.6, 3.1–3.2

Semester 5

Compliance for Textile Production (7.5 credits) - Objectives 1.1, 2.2, 2.5, 3.2
Elective Course I (7.5 credits)
Elective Course II (7.5 credits)
Elective Course III (7.5 credits)

Semester 6

Textile Technology Project with Scientific Methods (15.0 credits) - All Objectives
Thesis Project (15 credits) - All Objectives

Optional courses according to the specialization

Material Innovation

Smart Textiles (7.5 credits) - Objectives 1.1–1.4, 1.6, 2.1–2.3, 2.5–2.6, 3.1
Textile Recycling and New Sustainable Fibers (7.5 credits) - Objectives 1.1–1.4, 1.6, 2.1, 2.3, 2.5–2.6, 3.1
Textile Functionalization (7.5 credits) - Objectives 1.1–1.4, 1.6, 2.1, 2.3, 2.5–2.6, 3.1

Product Innovation

Construction Technology for Textile Products (7.5 credits) - Objectives 1.1, 1.3–1.4, 2.1, 2.5–2.6, 3.2
Production Technology for Textile Products (7.5 credits) - Objectives 1.1, 1.3–1.4, 2.1–2.2, 2.5–2.6, 3.1–3.2
Textile Prototyping for Production (7.5 credits) - Objectives 1.1, 1.3–1.5, 2.1–2.3, 2.5–2.6, 3.2

Admission Requirements

General entry requirements + Civics 1b or Civics 1a1 +1a2, Mathematics 2a or Mathematics 2b or Mathematics 2c and English 6

Degree

Upon completion of the education corresponding to the requirements in this educational plan, the student may, upon application to the university, obtain the following degree:
Bachelor of Science with a major in Textile Technology

The degree certificate is bilingual (Swedish/English). Together with the degree certificate, a Diploma Supplement (English) is provided. The Diploma Supplement is an appendix describing the issued degree's place in the Swedish education system. The issuance of the degree certificate takes place after application on a specific form. More information is available on the university's website.

Degree certificates are issued upon application in Ladok for students. More information is available at www.hb.se.

Student Influence and Evaluation

After completing a course, students are encouraged to participate in some form of course evaluation, oral or written. The opinions of students and participating teachers are compiled into a course report made available to current and future students. Course reports form the basis for semester evaluations conducted twice a year. During these meetings, student representatives, educational leaders, and program directors are present. The purpose is to have a dialogue about completed courses and how they could possibly be improved. The education is also linked to a program council that meets twice a year, including representatives from the industry, faculty, and students. During these meetings, the current relevance of the education and its demand in the job market are discussed and ensured.

Miscellaneous

Computer-based software programs are the central tools in the subject area during education, and good computer skills are recommended.

The education qualifies students for professional activities in textile technology on an international stage, in areas such as product innovation, material innovation, construction innovation, innovation management, quality management, laws, and standards, etc.

The language of instruction is English.

This syllabus is a translation from the Swedish written original.

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