UNIVERSITY OF BORÅS

# Advanced textile structures
## Avancerade textila strukturer

7.5 credits
7.5 högskolepoäng

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**Ladok Code:** AT2AT1
**Version:** 1.0
**Established by:** Committee for Education in Technology 2022-11-11
**Valid from:** Spring 2023

**Education Cycle:** Second cycle
**Main Field of Study (Progressive Specialisation):** Textile Engineering (A1N)
**Disciplinary Domain:** Technology
**Prerequisites:** Admitted to the Masterprogram in Textile Technology
**Subject Area:** Textile Technology
**Grading Scale:** Seven-degree grading scale (A-F)

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### Content

The course aims to provide the student with advanced technical knowledge about different processes of fabric production as well as how yarn/fibres properties and production methods affect the properties of fabric. The course embraces advanced weaving, advanced knitting, 3D weaving and 3D knitting, braiding, narrow textiles and non-woven processes.

Students will learn to choose the fabric production process that best fulfils a certain technical requirement specification.

The students will produce/source trial samples of different textile structures by (weaving, knitting and non-woven technologies). These processes will be optimized to achieve the required product engineering criteria and to evaluate the efficiency of the manufacturing process, with further characterisation and modelling of these fabrics.

The effect of textile structures on recyclability will be investigated as well. In addition, fabric functionalisation by dry methods such as plasma surface functionalization, and wet methods such as coating with functional polymer will be investigated and analysed.

### Learning Outcomes

Upon completion of the course, the student should be able to, with regard to,

**Knowledge and understanding**
1.1 demonstrate advanced technical know-how of fabric production processes and characterization in a systematic way,
1.2 describe the various stages in fabric production methods,
1.3 describe and explain the relationship between yarn/fibre properties and production methods,
1.4 understand the relationship between production methods and the properties of the fabric,
1.5 understand the use of digital tools in the production,
1.6 understand the relationship between textile structure and recyclability,
1.7 understand the methods of functionalization of fabrics and technical textiles

**Skills and Abilities**
2.1 identify suitable production methods for fabric based on the yarn/fibre properties,
2.2 choose the appropriate characterization technique to identify a fabric’s structure and describe the production process in a scientific context,
2.3 identify and interpret data from fabric testing and characterisation, and put them in a scientific context and communicate research results with both experts and layman,
2.4 demonstrate methodological skills to master and manage their own projects and collaborate with others, and
2.5 analyse and distinguish how production methods can affect the fabric properties.

**Critical judgement and evaluation**
3.1 Critically analyse and argue the fabric production process in terms of environmental impact and technology,
3.2 Select and argue about the chosen production method in relation to yarn/fibre properties,
3.3 Evaluate fabric structure in terms of technical performance, environmental impact and raw material requirements.

## Forms of Teaching

Lectures, seminars, group discussions, case studies, educational visits, project work and lab assignments.
The language of instruction is English.

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## Forms of Examination

The course is examined through the following exams:

• Exam
Learning outcomes: 1.1- 1.4, 1,7, 2.1-2.4, 2.4, 2.5, 3.1, 3.3
Credits: 2.5
Grading scale: A-F

• Assignment, seminars
Learning outcomes: 1.1, 1.2, 1.5, 1.6, 1.7, 2.3, 2.4, 2.5, 3.1, 3.3
Higher education credits 2.5
Grading scale: A-F

• Laboratory and written lab report
Learning outcomes: 1.3, 1.4, 1.6, 2.1, 2.2, 2.3, 3.2, 3.3
Credits: 2.5
Grading scale: A-F

The average value of the written exam, assignment, seminars, and lab report determines the course's final grade, which is granted once every examination step is passed.

Re-examination of laboratory work can only take place during an ongoing course.
If the student has received a decision/recommendation regarding special pedagogical support from the University of Borås due to disability or special needs, the examiner has the right to make accommodations when it comes to examination. The examiner must, based on the objectives of the course syllabus, determine whether the examination can be adapted in accordance with the decision/recommendation. Student rights and obligations at the examination are in accordance with guidelines and rules of the University of Borås.

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## Literature and Other Teaching Materials

Supplementary material is distributed during the course.
Additional hand-outs, scientific papers, lab-PM is provided through the UB learning platform.

The course is primarily intended for advanced level programmes in textile technology.

## Student Influence and Evaluation

The course is evaluated in accordance with current guidelines for course evaluations at the University of Borås in which students' views are to be gathered. The course evaluation report is published and returned to participating and prospective students in accordance with the above-mentioned guidelines, and will be taken into consideration in the future development of courses and education programmes. Course coordinators are responsible for ensuring that the evaluations are conducted as described above.

## Miscellaneous

This syllabus is a translation from the Swedish original.