



## Textile constructions for composite materials

### Textila konstruktioner för kompositmaterial

7.5 credits

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**Ladok Code:** AT2KM1

**Version:** 3.0

**Established by:** Committee for Education in Technology 2024-09-26

**Valid from:** Spring 2025

**Education Cycle:** Second cycle

**Main Field of Study (Progressive Specialisation):** Textile Technology (A1N)

**Disciplinary Domain:** Technology

**Prerequisites:** Bachelor's degree in textile technology, materials technology, polymer technology or equivalent. English 6.

**Subject Area:** Textile Technology

**Grading Scale:** Fail (U) or Pass (G)

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### Content

The course will give comprehensive knowledge and understanding of the composites, constituent materials for composite and composite fabrication processes. The course will cover the natural and synthetic fibers used as textile reinforcements. The main focus of the course is to deal with how textile reinforcements are structured and manufactured for optimal performance on the composite. Technical requirements for producing textile structures suited for composite material application will be introduced. Techniques for developing conventional flat weaving process to produce different textile products will be included. Latest 2D and 3D process developments for engineering textile reinforcements will be covered. These textile preforms have a major impact on the composite properties, in terms of composite mechanics that are a specific part of the content. The mechanical properties of the textile are governed by structure, material properties and material property compatibility.

### Learning Outcomes

After completing the course, the student should be able to:

#### Knowledge and understanding

1.1. describe textile technical structures and how these control the composite properties.

#### Skills and Abilities

- 2.1. account for how textiles can be used in composite materials to achieve high mechanical properties;
- 2.2. describe various advanced 2D and 3D processes available for manufacturing textile reinforcements,
- 2.3. select the appropriate reinforcement including preform structure to achieve desired properties,

#### Valuation and approach

3.1. assess suitable composite material designs for given applications.

### Forms of Teaching

The course consists of lectures and project work with supervision.

The language of instruction is English.

### Forms of Examination

- Examination  
Learning outcomes: 1.1, 2.1-2.3, 3.1  
Credits: 3 credits

Grading scale: Fail or Passed (U/G)

- Assignment  
Learning outcomes: 1.1, 2.1-2.3, 3.1  
Credits: 4 credits;  
Grading scale: Fail or Passed (U/G)
- Presentation  
Learning outcomes: 1.1, 2.1-2.3, 3.1  
Credits: 0.5 credits  
Grading scale: Fail or Passed (U/G)

To pass the course, the exam, assignment and presentation must be passed.

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 examination are in accordance with guidelines and rules for the University of Borås.

### **Literature and Other Teaching Materials**

Miravete, A. (1999). *3-D Textile Reinforcements in Composite Materials [Elektronisk resurs]*. Woodhead Publishing

### **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**

The course is a freestanding course.