

MSE-440

**Composites technology**

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<b>Cursus</b>	<b>Sem.</b>	<b>Type</b>
Materials Science and Engineering	MA1, MA3	Opt.
Mechanical engineering	MA1, MA3	Opt.

Language of teaching	English
Credits	3
Session	Winter
Semester	Fall
Exam	During the semester
Workload	90h
Weeks	14
<b>Hours</b>	<b>3 weekly</b>
Lecture	2 weekly
Exercises	1 weekly
<b>Number of positions</b>	

**Summary**

The latest developments in processing and the novel generations of organic composites are discussed. Nanocomposites, adaptive composites and biocomposites are presented. Product development, cost analysis and study of new markets are practiced in team work.

**Content****Basics of composite materials**

- Constituents
- Processing of composites
- Design of composite structures

**Current development**

- Nanocomposites
- Textile composites
- Biocomposites
- Adaptive composites
- Sustainable composites

**Applications**

- Driving forces and markets
- Cost analysis
- Aerospace
- Automotive
- Sport
- Biomed

**Keywords**

Composites - Applications - Nanocomposites - Biocomposites - Adaptive composites - Design - Cost

**Learning Prerequisites****Required courses**

Notion of polymers

### **Recommended courses**

Polymer Composites

### **Learning Outcomes**

By the end of the course, the student must be able to:

- Propose suitable design, production and performance criteria for the production of a composite part
- Apply the basic equations for process and mechanical properties modelling for composite materials
- Discuss the main types of composite applications

### **Transversal skills**

- Use a work methodology appropriate to the task.
- Use both general and domain specific IT resources and tools
- Communicate effectively with professionals from other disciplines.
- Evaluate one's own performance in the team, receive and respond appropriately to feedback.

### **Teaching methods**

Ex cathedra and invited speakers

Group sessions with exercises or work on the project

### **Expected student activities**

Attendance at lectures

Design of a composite part, bibliography search

### **Assessment methods**

Written exam + report and oral presentation in class

### **Supervision**

Office hours                      Yes

### **Resources**

#### **Moodle Link**

- <https://go.epfl.ch/MSE-440>