

# Module 4: Cork-based composites, composite manufacturing methods

IO1 – Educational Curriculum



# Description of the module

This module describes the basics of cork-based composites and the methods of how the composite material is manufactured. We will explain the selection of the most suitable cork material as a filler in the composite material and the structure of a three-layer composite material. As well as the usage of a cork-based composite material in unmanned aerial vehicles.



# Description of the module

This module is divided into two main units:

## 1. Cork-based composites:

- Three-layer sandwich composites with cork as a core review/types.
- The most important properties and advantages as well as disadvantages of three-layer sandwich composites with cork core for the aviation industry.
- Areas of usage of three-layer sandwich composites with cork core in the aviation industry and UAV.



# Description of the module

## 2. Composite manufacturing methods:

- Introduction of how composite materials are manufactured.
- Methods of production of three-layer sandwich composite elements with cork core:
  - Construction of three-layer sandwich composite material with cork core using bulk cork granules.
  - Construction of three-layer sandwich composite material with cork core using sheets of cork material.



# Description of the module

The first unit focuses on the cork-based sandwich material. It will look closely at the types of material used as a filler, as well as their properties. Along with their advantages and disadvantages. Furthermore, it will present the best properties of the cork-based core material that is best suited for usage in the composite material. And the usage in UAVs. The second unit will explain the methods of how the the composite is manufactured.



# Target Groups

- Engineering students (Aerospace, Aeronautical, Materials and Mechanical Engineering)
- Engineers, technical staff and leaders in Aerospace and Aeronautical Industries



# Learning Objectives

Upon completion of this module, attendants will be able to:

- Understand how cork-based composites are manufactured.
- What kind of cork material is best suited for sandwich composites.
- Cork-based composites usage in UAVs.



# Learning Resources

- Aeronautical Laboratory
- Construction laboratory
- University Airfield Kyviškės
- Scientific articles





# Self-assessment and Learning Activities

- Practice questions
- Quiz
- Module summary
- Lamination of sandwich cork plates
- Testing and flying UAV in the airfield
- Book

