

# Composite Materials

1. **Course number and name:** 020MACCS5 Composite Materials
2. **Credits and contact hours:** 4 ECTS credits, 2x1:15 contact hours
3. **Name of instructor:** Melissa Said
4. **Instructional Materials:**
  - Engineering Mechanics of Composite Materials, I. M. Daniel, O. Ishai, 2006
  - Composite Materials Science and Engineering Third Edition, K. K. Chawla, 2012
5. **Specific course information**
  - a. **Catalog description:**

This course explores the fundamental principles of composite materials, covering their classification, manufacturing, characterization, micromechanics, and macromechanics. Nonconventional composites are also discussed.
  - b. **Prerequisites:** 020CITNI4 Inorganic Chemistry and laboratory; 020CHPCS1 Polymer Chemistry
  - c. **Required/ Selected Elective/Open Elective:** Selected Elective
6. **Educational objectives for the course**
  - a. **Specific outcomes of instruction:**
    - Gain comprehensive understanding of composite materials and their classifications.
    - Understand basic manufacturing processes and characterization methods of composite materials.
    - Explore micromechanics principles in composite materials.
    - Analyze the elastic behavior of composite plies and laminates.
    - Gain knowledge of nonconventional composites.
  - b. **PIs addressed by the course:**

PI	1.1	1.2	1.3
Covered	x	x	x
Assessed	x	x	x

7. **Brief list of topics to be covered**
  - Introduction to composite materials
  - Manufacturing and characterization
  - Micromechanics
  - Elastic behavior of a ply (macromechanics part 1)
  - Elastic behavior of a laminate (macromechanics part 2)
  - Nonconventional composites