



UNIVERSITÀ
DEGLI STUDI
DI PADOVA



Intensive Course

Advanced Design with Composite Materials

June 16-20, 2025

In-Person and Virtual Attendance

Department of Management and Engineering - University of Padova
Complesso Universitario di Viale Margherita – Vicenza (ITALY)



Course coordinator: Prof. Marino Quaresimin, University of Padova

COURSE OVERVIEW

The course is specifically designed for engineers, technicians, and designers working in the composites industry who wish to acquire a deeper understanding of the structural design of polymer matrix composites parts. The first day will be dedicated to the introduction of basic topics to bring newcomers to a level suitable for the course attendance. The advanced module provides an overview on state-of-the-art and advanced methodologies related to topics such as static design (strength and stiffness), fatigue design, bonded joints, design of 3D-printed parts, design of short fibre reinforced parts, structural health monitoring. A lab session is also planned to provide an insight into the testing activity essential for a safe and reliable design.

The entire course will consistently refer to pragmatic and implementation aspects related to the industrial reality and examples of practical applications will be discussed.



NAFEMS



COURSE PROGRAM

Base module

Monday, June 16 afternoon

- 1) Materials, constituents and manufacturing technologies
- 2) Micromechanics and basic elastic and strength properties

Tuesday, June 17 morning

- 3) Macromechanics and stress/strain rotation
- 4) Stress analysis (CLT) and classical failure criteria

Advanced module

Tuesday, June 17 afternoon

- 1) Course introduction, objectives and methodology
- 2) Damage mechanics of composites under static and cyclic loadings

Wednesday, June 18 full day

- 3) Failure criteria and basic approaches to predict damage and failure under quasi-static loadings, including notch effect
- 4) Approaches for the design against fatigue and SN curve-based life prediction
- 5) Advanced discrete damage approach for the damage and life prediction
- 6) Examples of calculation and product development case histories

Thursday, June 19 full day

- 7) Testing and damage analysis of composites: lab session 1 (in presence only)
- 8) Testing and damage analysis of composites: lab session 2 (in presence only)
- 9) Bonded joints: damage mechanics, classical and advanced modelling approaches
- 10) Mechanical behaviour and design approaches for 3D printed continuous fiber composites

Friday, June 20 morning

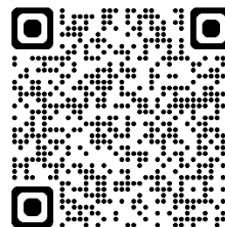
- 11) Mechanical behaviour and design approaches for short-fibre composites
- 12) Structural Health Monitoring
- 13) Closure

REGISTRATION FEES

	In-Person attendance*	Virtual attendance
Base module only	500 + VAT	400 + VAT
Advanced module only	1700 + VAT	1200 + VAT
Base module + Advanced module	2000 + VAT	1500 + VAT

*includes lunches, coffee breaks and (for the advanced module only) course dinner

For more information and inquiry:
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Get to know us: [Composite Group at DTG](#), [Composite Lab DTG](#)

