

Short course Experimental Techniques and Testing of Composite Materials

(9 – 10 July 2015)

Aims and contents. This short course aims at providing young scientists and engineers both from Academia and Industry with a comprehensive insight on testing methods for mechanical characterization and damage analysis of composite materials. The course consists of two-day program with classroom lectures and practical testing sessions in laboratories, according to the tentative schedule attached. The course can be thought of as either preparatory to the “*summer school on fatigue and damage mechanics of composite materials*”, or as a stand-alone event for people interested in broadening their knowledge on the practical procedures for testing polymeric composites.

Lecturers. Marino Quaresimin, Michele Zappalorto, Paolo Andrea Carraro, Nicola De Rossi (DTG-University of Padova)

Participants. The course is designed for Ph.D. students, young researchers and industry engineers working in the field of composite materials interested in broadening their knowledge of testing methods and procedures for polymeric composites.

General Information.

The course will be held at the Department of Management and Engineering of the University of Padova, in Vicenza, Italy, from July 9th to July 10th, 2015.

Registration fees are 250 € for students, 500 € for academic staff, 700 € for industry staff. Registration fees include a course kit with teaching material, lunches and coffee breaks. The number of participants will be limited to 25 people for a safe and effective laboratory activity.

The deadline for registration is 26 of June 2015.

Preliminary program

	Thursday, 9 July	Friday, 10 July
9.00-10.45	Testing for design data: brief introduction to the theory of elasticity and failure criteria for anisotropic materials - Experimental techniques for mechanical characterisations.	Practical testing in laboratory (fatigue and impact tests)
10.45-11.15	Break	Break
11.15-13.00	Testing for damage investigations: specific needs of damage analysis. Experimental techniques for damage mechanics analysis	Practical testing in laboratory (data reduction)
13.00-14.30	Lunch	Lunch
14.30-16.00	Practical testing in laboratory (tensile, bending, shear and compressive tests)	Practical testing in laboratory (sample preparation and optical microscopy)
16.00-16.20	Break	Break
16.20-18.00	Practical testing in laboratory (fracture mechanics tests)	Practical testing in laboratory (Infrared thermography, X-Rays, Ultrasounds)



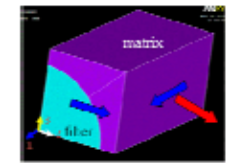
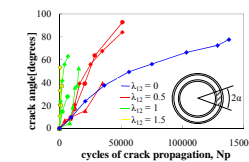
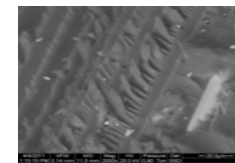
Summer School on Fatigue and Damage Mechanics of Composite Materials (13 – 17 July 2015)

and

Short Course on Experimental Techniques and Testing of Composite Materials (9 – 10 July 2015)

Organized by

The Department of Management and Engineering - University of Padova



Endorsed by and in cooperation with



Summer School

Fatigue and Damage Mechanics of Composite Materials (13 - 17 July 2015)

Aims and contents. The School aims at providing young scientists and engineers both from Academia and Industry with the unique opportunity to meet and learn from leading international experts advances in the fatigue and damage mechanics of composite materials, comprising theoretical bases, experimental methods and examples of practical industrial applications. Particular attention will be devoted to the understanding of damage mechanisms and the paths to incorporate them into predictive models. During the five-day program, senior researchers and industry representatives will provide lectures on experimental techniques for damage investigations of polymer composites, damage evolution under fatigue, analytical and numerical modeling of damage and examples of design against damage in advanced industrial applications.

School Coordinator: Marino Quaresimin, DTG-University of Padova - Italy

Lecturers from international research institutions and industries

Elif Ahci, Head of Blades and Rotors Analysis Group, Airbus Helicopters - Germany

Yongxin Huang, Blade Design Engineer, Siemens Wind Power- USA

Stefan Klaus Nothdurfter, Head of Engineering, Automobili Lamborghini -Italy

Stephen Ogin, Professor, University of Surrey, Guildford - UK

Marino Quaresimin, Professor, University of Padova - Italy

Ramesh Talreja, Professor, Texas A&M University - USA

Janis Varna, Professor, Luleå University of Technology - Sweden

Luca Vescovi, Automotive program manager, Dallara Automobili - Italy

Participants. The course is specifically designed for Ph.D. students, young researchers and industry engineers working in the field of composite materials, who are supposed to be provided with a basic knowledge of the mechanics of composites. Diplomas will be issued on the basis of course participation and evaluation of homework assignments and will entitle Ph.D. students to 5 ECTS.

General Information

The School will be held at the Department of Management and Engineering of the University of Padova, in Vicenza, Italy, from July 13th to July 17th, 2015.

Registration fees are 500 € for students, 1000 € for academic staff, 1600 € for industry staff. Registration fees include a course kit with teaching material, lunches and coffee breaks. The possibility to provide a limited number of grants covering the registration fees of highly qualified PhD students is being explored.

The deadline for registration is 12 June 2015.

For additional information and registration to the event please visit the website

www.gest.unipd.it/damageschool2015

Preliminary program

										Friday, 17 July
9.15-10.45	Precourse activity: brief overview on theory of elasticity, micromechanics and failure criteria for anisotropic materials and composite laminates	Experimental techniques for damage analysis (M.Quaresimin)	Strategies and approaches for damage modelling (R. Talreja)	Effects of Manufacturing defects on damage evolution (R.Talreja)	Applications - Procedures for design and implementation of the methodologies discussed during the course	Break	Break	Break	Break	Applications - Procedures for design and implementation of the methodologies discussed during the course
10.45-11.15	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break
11.15-12.45	Precourse activity: brief overview on theory of elasticity, micromechanics and failure criteria for anisotropic materials and composite laminates	Structural health monitoring (general methods and FBG) (S. Ogin)	Strategies and approaches for damage modelling (R. Talreja)	Applications: Damage and modelling in bonded joints (M.Quaresimin)	Applications - Procedures for design and implementation of the methodologies discussed during the course	Break	Break	Break	Break	Applications - Procedures for design and implementation of the methodologies discussed during the course
12.45-14.15	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
14.15-15.45	Introduction to the course. Damage mechanics and design in composite materials structures (M.Quaresimin)	Stress analysis tools for damage mechanics (J.Varna)	Damage evolution and modelling under multiaxial fatigue loading (M.Quaresimin)	Applications and future opportunities in aerospace, automotive and wind industry	Closure					
15.45-16.15	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break
16.15-17.45	Damage mechanisms (transverse cracking, delaminations, fiber failure, micromechanisms) (S.Ogin)	Stress analysis tools for damage mechanics (J.Varna)	Damage evolution and modelling under multiaxial fatigue loading (M.Quaresimin)	Applications and future opportunities in aerospace, automotive and wind industry						