

Comprehensive Basics of High-Performance

Composites for Aircraft Construction


19th - 23rd February 2007

EPMA
European Postgraduate Master in
Aeronautical Engineering

EUROPADS
EUROPEAN PROFESSIONAL
AEROSPACE DEVELOPMENT
SCHEME

 **Luftfahrtstandort
Hamburg**
Hamburg – The place for aviation

TUHH
Technische Universität Hamburg-Harburg

 **TUHH**
POLYMER COMPOSITES

 **TuTech**
INNOVATION
Wissen. Technologie. Märkte

AIM

The aim of this module is to provide a deeper understanding about properties, manufacturing and application of high performance composite materials used in aircraft.

TARGET DELEGATES

This module is intended for graduated engineers, equivalent professionals and/or managers. It is likewise suitable for specialists in search of a broader perspective as well as for newcomers to the field.

LEARNING OUTCOMES

On completion of the module, delegates will be able to:

- Understand the behaviour of composites under load due to the properties of reinforcement and matrix materials as well as the design of composite parts.
- Optimize the design of composites considering typical damage mechanisms and manufacturing processes.
- Estimate and calculate mechanical properties of composite materials like stiffness and strength under several loading conditions.
- Evaluate destructive and non-destructive test methods for composite parts.
- Apply methods for quality assurance in composite manufacturing processes.

LEARNING ENVIRONMENT

The module will include lectures with application examples, parts review and discussions, industrial and operators field visits.

PRE-MODULE STUDY

Delegates will be expected to undertake preparation, reading of pre-course material and to exercise reference literature.

MODULE CONTENT

Introduction, overview to fibre and matrix materials, manufacturing processes, calculation of elastic material properties of laminates, damage mechanisms of fibre reinforced composites, quality assurance in manufacturing processes, non-destructive and destructive test methods as well as estimation methods for strength calculations.

Speakers are senior experts and scientific co-workers from the University (TUHH).

POST-MODULE ASSIGNMENT

Delegates will be offered assignment tasks, which comprise knowledge gained during the module and related to their own activities; topics should be mutually be agreed upon.

VENUE

Hamburg University of Technology (TUHH), Technology Centre Hamburg-Finkenwerder (THF), Germany.

COST

Module fee: € 1.480,- (+ 19% VAT) inclusive didactical and testing material, coffee breaks and well come snack on Monday evening (transport, accommodation, lunch and dinner are not included). Lunch is available at the airbus canteen inside the building.

The module may be cancelled if a minimum number of registrants are not reached; all fees will be refunded. Registrants who cancel before 15 January 2007 will receive 25% refund, no refunds given for cancellation after 15 January 2007, but substitution of a registrant is accepted at any time.

After we receive your application we will send you an invoice with payment details that will also serve as confirmation of your registration.

MODULE PROGRAMME

Monday	Tuesday	Wednesday	Thursday	Friday
Constituents of composite materials and mechanical fundamentals	Calculation of elastic laminate properties and manufacturing processes	Production and quality assurance	Damage mechanisms and materials testing methods	Recapitulation and final examination
8:30 Introduction	8:30 Classical laminate theory (CLT 2)	8:30 Influence of damage on properties and lifetime	8:30 Damage mechanisms	8:30 Resume
10:00 Coffee break	10:00 Coffee break	10:00 Coffee break	10:00 Coffee break	9:30 Preparation and questions
10:15 Fibre and matrix materials	10:15 Manufacturing II	10:15 Quality assurance	10:15 Exercise: Calculation of composite strength	10:45 Coffee break
11:45 Lunch break	11:45 Lunch break	11:45 Exercise: QS		11:00 Test
12:30 Properties of a UD-layer	12:30 Exercise CLT-2	12:15 Lunch break	12:30 Lunch break	11:45 Lunch break
14:00 Elastic properties of laminates (CLT-1)	13:45 Exercise CLT-3	13:00 NDT Methods	13:15 Lab: Mechanical testing	12:30 Module evaluation
14:45 Exercise: CLT-1	15:00 Coffee break	14:30 Coffee break	14:45 Exercise: Mechanical testing I	12:45 End of seminar Certificate
15:30 Coffee break	15:15 Lab: Manufacturing	14:45 Lab: NDT	16:15 Exercise: Mechanical testing II	
15:45 Manufacturing I	17:15 Discussion	17:15 Discussion	17:00 Discussion	
17:15 Discussion				

TuTech

TuTech Innovation GmbH is a company owned jointly by Hamburg University of Technology (TUHH) and the Free and Hanseatic City of Hamburg whose mission is to promote effective transfer and exploitation of scientific and technical knowledge. TuTech manages contract research and technical exploitation projects, provides assistance for young technology orientated start-ups as well as other forms of knowledge transfer such as organisation of conferences, networking events.

EPMA EUROPADS

The objective of EPMA (European Postgraduate Master in Aeronautical Engineering) is to create a new joint European postgraduate master programme for part time students. The continuing professional development module is in line with the ideas and targets of EUROPADS. EUROPADS was a pilot project financed by the European Commission under the LEONARDO DA VINCI programme, providing a modular European Professional Aerospace Development Scheme for engineers and technical managers within the European aerospace industry involving universities and leading aerospace companies from six countries.

TUHH

Hamburg University of Technology is a young, enterprising, small university, located on an attractive campus. It is highly regarded in Germany for the inter-disciplinary and industrial orientation of its research. It has gained national recognition for being at the forefront of establishing innovative ways for industry-academic collaboration across a whole range of technical subjects.

MODULE LEADER

Prof. Dr.-Ing. Karl Schulte, Polymer Composites Section, Neßpiel 5 (THF), 21129 Hamburg, Germany, Tel. +49 40 42878-3138, Fax +49 40 42878-2002, E-Mail: schulte@tuhh.de

APPLICATION & ENQUIRY FORM

Name _____

Function _____

Organization _____

Address _____

Phone _____ Fax _____

E-Mail _____



TuTech Innovation GmbH
Harburger Schloßstrasse 6-12
21079 Hamburg, Germany
<http://www.tutech.de>

Please forward this slip by 15th January 2007 to TuTech - Attn. Gerlinde Löbkens, Harburger Schloßstrasse 6-12, 21079 Hamburg, Germany. Tel: +49 40 76629 6551, Fax: +49 40 76629 6559, E-Mail: loebkens@tutech.de; <http://www.tutech.de/veranstaltungen>