



## SHORT COURSE **INTRODUCTION TO AIRCRAFT AEROELASTICITY AND LOADS**

**14 – 18 July 2014**

**Queen's Building, University Walk, University of Bristol, BS8 1TR.**

### **Course Objectives:**

- To introduce the main concepts of Aeroelasticity and Loads, and the multi-disciplinary methods needed for their study
- To provide an understanding of the main principles of Aeroelasticity and Loads analysis by:
  - using simple mathematical models to illustrate basic theoretical concepts,
  - showing the maths – but not explaining all of the detail and derivations, instead focusing on the connection with the physics
  - introducing relevant terminology and methods, and
  - explaining the analysis, testing and certification processes used by the aerospace industry
- To include examples on some of the key topics

The course will be based upon the Wiley text – Introduction to Aircraft Aeroelasticity and Loads – and a short course that has been run in industry over the last 5 years. It will consist of a combination of lectures and hands-on tutorial sessions. The course is being run as part of the EU funded ALPES (Aircraft Loads Prediction using Enhanced Simulation) Marie-Curie Initial Training Network.

### **Course Content:**

- Introduction to aeroelasticity and loads
- Vibration of single DoF systems
- Vibration of multi DoF systems
- Vibration of continuous systems
- Steady aerodynamics
- Static aeroelasticity – lift distribution
- Static aeroelasticity – control effectiveness
- Unsteady aerodynamics
- Flutter
- Control
- Aeroservoelasticity
- Basic concepts of loads and dynamics
- Equilibrium manoeuvres
- Flight mechanics model
- Dynamic manoeuvres
- Gust and turbulence encounters
- Ground manoeuvres
- Internal loads
- Component loads
- Vibration of continuous systems - Finite Elements
- More advanced aerodynamic methods
- Coupled structural / aerodynamic models
- Industry practice – mathematical models
- Industry practice – testing
- Tutorials

**Course Tutors:**            **Professor Jonathan Cooper – University of Bristol**  
                                      **Professor Jan Wright - Emeritus Professor University of Manchester**

**Course fee:**        **£250 University students and academics**  
                              **£600 Industrial participants**  
**(Fee includes all course materials and lunches as well as tea/coffee.)**

To register for the course please use the University of Bristol Online Shop using the following link:-  
<http://shop.bris.ac.uk/>

For further information please contact: [sarah.hassall@bristol.ac.uk](mailto:sarah.hassall@bristol.ac.uk)