

Accommodation

The organizers have arranged block reservations with Husa Hotels Chain in different hotel categories, offering special rates to the COMPLAS participants. Please, note that block reservations expire on 3th July 2007. See details on:
<http://congress.cimne.upc.es/complas07frontal/Acom.asp>

Registration Fees

The fee for the Short Course is **390 €**. This includes extended course material, coffee and lunches.

Grants: A number of grants is available. Interested persons please contact the Course Secretariat.

The **reduced combined fees** for participants to both the course and the COMPLAS IX Conference are:
Delegates: **780 €**
Students: **520 €**

For more information on the 9th COMPLAS conference visit the web address given below.

REGISTRATION MUST BE PERFORMED ELECTRONICALLY VIA THE COURSE WEB SITE:
<http://congress.cimne.upc.es/complas07/course>



Location

The Short Course will take place at the CIMNE Conference Room, Universitat Politècnica de Catalunya, Edificio C1, Campus Norte UPC, Gran Capità s/n, 08034 Barcelona, Spain

Secretariat:

International Center for Numerical Methods in Engineering (CIMNE)
COMPLAS IX SECRETARIAT
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Supporting Organisations



Universitat Politècnica de Catalunya



University College of Swansea

The event is supported by the EU Marie Curie Programme and a number of fellowships are available to young scientists.



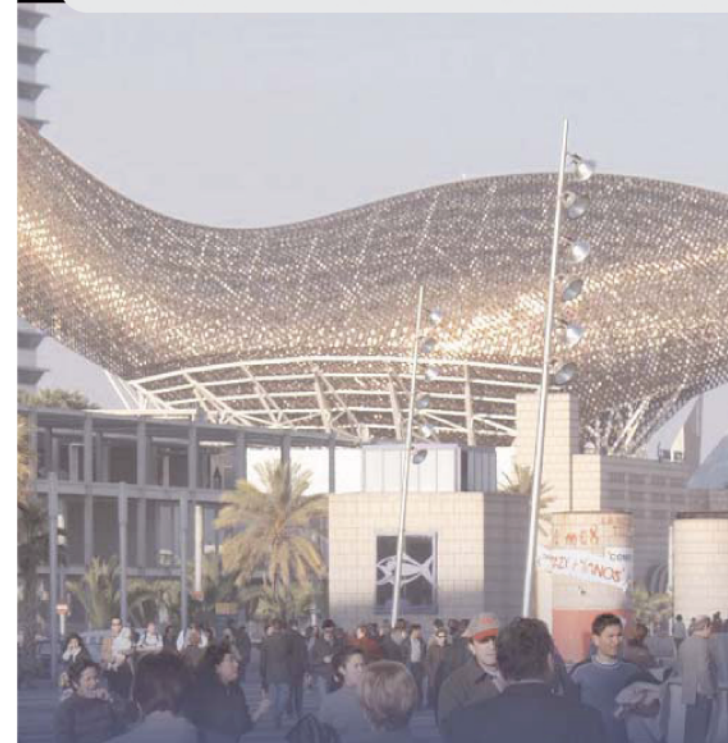
The different fellowship categories are detailed in a booklet, which is available for download from:
<http://www.eua4x.net/Documents/libretto%20eua4x.pdf>



COMPLAS Course

Ninth Short Course on Computational Techniques for Plasticity

3-4 September 2007, Barcelona, Spain



In conjunction with the 9th International Conference on Computational Plasticity: Fundamentals and Applications, COMPLAS 2007

5-7th September 2007, Barcelona, Spain

This is a course to be run in conjunction with the 9th International Conference on Computational Plasticity - COMPLAS IX, held at Barcelona 5-7th September 2007. The pre-conference course should be of benefit to participants interested in acquiring a detailed and in-depth description of the application of finite element techniques to a range of plasticity problems; particularly those involving finite strains. The course can be attended separately from the conference, but a reduced combined fee is available to participants in both events.

Lecturers

D. R. J. Owen, D. Peric & E. A. de Souza Neto University of Wales Swansea, UK

E. Oñate, C. Agelet de Saracibar, M. Cervera & S. Oller Universitat Politecnica de Catalunya, Barcelona, Spain

Objectives

The purpose of the course is to present and demonstrate the use of finite element based methods for the solution of problems involving plasticity. Particular attention will be devoted to finite strain conditions, with consideration being given to both rate independent and rate dependent situations. The use of numerical techniques is essential for solving problem involving complex geometry and including non-linear geometrical and material behaviour and such computations are being increasingly undertaken in industrial and research environments. The continuing advances in computer hardware developments will accelerate the acceptance of such numerical techniques for commercial analysis and design.

There have been significant advances in the last few years in the development of robust and efficient solution procedures for elasto-plastic problems. In particular, the treatment of finite strain plasticity problems has reached a sufficient stage of maturity for the solution of practical problems to be undertaken with confidence. The course considers rate independent (quasi-static) and rate dependent (viscoplastic and dynamic) situations for both infinitesimal and finite strain conditions.

In addition to establishing the fundamental theoretical expressions in a form suitable for numerical implementation, emphasis is placed on the development and implementation of consistently linearised algorithms to ensure quadratic convergence rates. Other topics associated with the simulation of practical problems will be covered; including contact/friction modelling, damage evolution, advanced constitutive models, adaptive meshing concepts and the fundamentals of multi-scale modelling.

The course will also provide a short introduction to the topic of discrete elements which, when used in conjunction with conventional finite elements, provide a powerful procedure for several important classes of problems, such as multi-fracturing solids.

Consideration will be given to the practical difficulties encountered in the solution of industrial problems and time will be devoted to general discussion and the provision of specific problem advice.

Programme

Day 1 September 3th

- 9.00-11.00 **Computational Plasticity - Basic principles and theory, D. Peric**
- Introduction to elasto-plasticity and viscoplasticity
 - The basic approach to incremental solution - consistent linearisation
 - Finite element modelling
- 11.00-11.30 Coffee
- 11.30-13.30 **Elasto-plasticity/viscoplasticity with finite strains, D. Peric and E.A. de Souza Neto**
- Fundamentals
 - Constitutive modelling - Hyperelastic & plasticity relations
 - Operator split methodology for numerical integration of the constitutive model
 - Mesh adaptivity procedures
- 13.30-15.00 Lunch
- 15.00-16.30 **Further issues in plasticity modelling E. A. de Souza Neto**
- Treatment of singular and other yield surfaces
 - Element formulation for near-incompressibility
- 16.30-17.00 Coffee
- 17.00-18.00 **Explicit time integration procedures E. Oñate**
- Finite element formulation and implementation
 - Applications to metal forming problems

Day 2 September 4th

- 9.00-10.00 **Thermo-mechanical problems with frictional contact, C. Agelet de Saracibar**
- Fundamentals formulation
 - Finite element formulation
 - Applications to metal forming problems
- 10.00-11.00 **Plastic damage approach to fatigue analysis, S. Oller**
- Concepts of fatigue damage
 - Computational formulation
 - Numerical examples
- 11.00-11.30 Coffee
- 11.30-12.30 **FE approaches to tensile fracture, M. Cervera**
- Discrete and smeared approaches
 - Weak and strong discontinuities
 - Local and non-local models
 - Numerical examples
- 12.30-13.30 **Discrete element approaches to multi-fracturing solids, D.R.J. Owen**
- Fundamentals of discrete elements
 - Continuum to discrete transformation
 - Coupled field problems
 - Numerical examples
- 13.30-15.00 Lunch
- 15.00-16.30 **Introduction to multi-scale modelling, E.A. de Souza Neto**
- Fundamentals
 - Computational modelling
 - Applications
- 16.30-17.30 **General discussion & Course closure**

