

VENUE INFORMATION

This is a course offered to Graduate students interested in current research in solid and fluid mechanics. The course runs June 21-23, 2023, just before the conference ECCOMAS MSF 2023, which is held June 25-27, 2023 (for more details, please visit conference webpage: <http://www.gf.unsa.ba/eccomas-msf-2023/>).

Despite a reduced fee, the course students will also be admitted to the conference scientific program, but not to all social events.

The conference venue is **Sarajevo**, the capital of Bosnia and Herzegovina. The city urban area provides home to the population of roughly half a million. Sarajevo, or 'Palace place', has always been the major crossroad in the center on migration paths and conquests by Eastern Roman Empire, Slavs, Jews from Spain, Ottoman and Austro-Hungarian Empires, each leaving the imprint and contributing to the rich cultural heritage and numerous monumental buildings that remain in the city.

In ex-Yugoslavia, city of Sarajevo was known for most vibrant music scene, 1984 Winter Olympic Games, and the long siege in 1990's during the break-up of the country. Presently, Sarajevo has fully regained its status as the crossroad between East and West and a new tourist 'must-see' destination with well-known 'Sarajevo-Film-Festival'. The travel guide series, Lonely Planet, has ranked Sarajevo as one of the top ten cities to visit in 2010. In 2011, Sarajevo was nominated to be the European Capital of Culture in 2014 and 2019, hosting the European Youth Olympic Festival in 2019.

The course is co-organized under sponsorship of Academy of Sciences and Arts of Bosnia-Herzegovina (ANUBiH) and Central European Association for Computational Mechanics (CEACM).

Course venue/ contact address (see plan below):

Gradjevinski fakultet (see Figure below)

Address: Patriotske lige 30, Sarajevo, BH



COURSE OBJECTIVES

The main objective of this course is to provide graduate students and researchers, with an extensive review of numerical models for computational solid and fluid mechanics, and pertinent modern developments in model reduction, probability aspects and uncertainty quantification. It presents the current state-of-the-art in finite element, finite volume and discrete element modeling of nonlinear problems in solid and fluid mechanics, and their coupling with thermal fields and interaction. It will illustrate the difficulties (and their solutions), which appear in a number of applications from mechanical, aerospace and civil engineering or material science. All the sources of nonlinear behavior are presented in a systematic manner, related to kinematics, equilibrium, constitutive equations, or boundary and coupling conditions. Special attention is paid to dealing with a class of problems with nonlinear constitutive behavior of materials, large deformations, and rotations in solid and fluid mechanics.

In addition, a detailed presentation of modern probability aspects is given, which is of great interest for current research for quantifying the epistemic uncertainties pertinent to the material heterogeneities, and aleatoric uncertainties pertinent to evolution problems.

Our second objective is to provide the participants with a solid basis for using the FEM, FVM or particle based models and software in trying to achieve the optimal design, and/or to carry out a refined analysis of nonlinear behavior of structures or multibody systems in real-life simulations. The course finally provides a basis to account for any pertinent multi-physics and multi-scale effects, which are most likely to provide significant innovations and break-through in a number of industrial applications.

Course Material: copy of scientific papers and lecture notes

Course Textbooks:

-Nonlinear Solid Mechanics: Theoretical Formulations and Finite Element Solution Methods (2009), Springer, URL: <http://springer.com/978-90-481-2330-8>

-Computational Methods for Solids and Fluids: Multiscale Analysis, Probability Aspects and Model Reduction (2016), Springer, URL: <http://www.springer.com/fr/book/9783319279947>

-Structural Engineering: Models and Methods for Statics, Instability and Inelasticity (2023), Springer, URL: <http://springer.com/978-3-031-23591-7>

ECCOMAS MSF 2023 Conference Course (3 ECTS)



Course Announcement & Call for participants

Short Course at 6th ECCOMAS MSF 2023 Current Research on Solids & Fluids: Computations, FE Code Coupling, Model Reduction, Probability...

June 21 - 23, 2023



Sarajevo, BiH

co-organized by:

UTC-Sorbonne Univ., France &
Univ. Sarajevo, Bosnia and Herzegovina
IUF, France & ANUBiH, BH & CEACM

