

# Courses 2016-17

BCAM Mazarredo 14 ,48009 Bilbao, Basque Country, Spain

May 22-26, 2017, 10:00-13:00 h

(5 sessions, a total of 15 hours)

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## FIVE LECTURES ON FINITE ELEMENT MODELLING

In this course, we will focus on:

- Isogeometric analysis as a finite element method that uses B-splines as basis functions. A basic description of their efficiency, their use in variational forms and the construction of tensor product spaces. Convergence of the discrete method with mesh refinement and polynomial order with respect to the number of degrees of freedom. Solution cost of the method and refined isogeometric analysis as a solution strategy that minimizes error and solution cost.
- Dispersion analysis of standard  $C^0$  finite elements versus isogeometric analysis. A description of Strang and Fix Pythagorean Theorem and its generalization to analyze spectral elements and optimally blended finite elements and isogeometric analysis.
- Time marching methods. Description of finite differences and finite elements in time. Use of spectral elements in time marching.

Additional topics that can be discussed depending on the interest of the attendees are: the weak imposition of boundary conditions, isogeometric divergence-conforming discretizations, and optimal quadratures for isogeometric methods.

Registration is free, but **inscription is required before 17th May**: So as to inscribe send an e-mail to [roldan@bcamath.org](mailto:roldan@bcamath.org). Student grants are available. Please, let us know if you need support for travel and accommodation expenses

