

Courses 2016-17

November 28-December 2, 2016 (5 sessions) Time: 09:00 - 11:00 (a total of 10 hours)

BCAM Mazarredo 14, 48009 Bilbao, Basque Country, Spain

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POPULATION DYNAMICS: THEORY AND APPROXIMATION

The course will cover the development of some classical demographic models based on ordinary differential equations (Malthus, Verhulst's logistic) and on partial differential equations with a structure variable representing the age of the individuals (McKendrick, Gurtin-Mac Camy). The Malthus and the McKendrick models naturally lead to exponential growth of the population, while the Verhulst and the Gurtin-Mac Camy models lead to bounded solutions.

Examples will be given of fitting the models to real-life data, bringing to light some missing features in all these models that are responsible for qualitative mismatches such as data exhibiting linear growth.

Some finite difference methods will be presented for the approximation of solutions, together with a quantitative analysis of the main sources of errors in predictions based on the models.

*Registration is free, but inscription is required before 12th October: So as to inscribe send an e-mail to roldan@bcamath.org. Student grants are available. Please, let us know if you need support for travel and accommodation expenses.