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## ERASMUS Blended Intensive Program, 21-25 July 2025. Cagliari, Italy

Theoretical and numerical analysis of differential equations and their applications  
University of Cádiz (ES), University of Cagliari (IT), Hacettepe University (TR)



**Overview:** This 5-day course on *Theoretical and Numerical Analysis of Differential Equations and Their Applications*, offered at the University of Cagliari, will cover both theoretical and numerical aspects of differential equations, with a focus on solving real-world problems in science and engineering. The course, coordinated by the *Department of Mathematics and Computer Science* from the University of Cagliari and involving partner universities, is available at undergraduate and graduate levels. Participants will earn **3 ECTS** credits upon completion.

**Organizers:** Daniel Acosta Soba (University of Cádiz), Rafael Díaz Fuentes (University of Cagliari), Fatma Gamze Düzgün (University of Cagliari), Berke Kaleboğaz (Hacettepe University), Eylem Öztürk (Hacettepe University), José Rafael Rodríguez Galván (University of Cádiz), Giuseppe Viglialoro (University of Cagliari).

**Contact:** Giuseppe Viglialoro, Email: [giuseppe.viglialoro@unica.it](mailto:giuseppe.viglialoro@unica.it)

**Venue:** Palazzo delle Scienze, Via Ospedale 72, Cagliari, Italia.

### Course 1. General Introduction to Ordinary Differential Equations & Applications to Real-World Models

**Contents:** *Some Types of Linear ODEs and Systems, Mathematical Modellings and Applications of linear ODEs and Systems*

### Course 2. Some types of linear PDEs and Systems & Numerical Methods for PDEs

**Contents:** *Some Types of Linear PDEs and Systems: Boundary Value Problems and Modelling- Galerkin Methods for PDEs: Analysis, Implementation and Application*

### Course 3. Mathematical Modelling and Applications of PDEs and Systems

**Contents:** *Introduction to Second Order PDEs. From Laplace's Equation to Chemotaxis Systems*

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