Theoretical and numerical analysis of differential equations and their application

University of Cagliari, Department of Mathematics and Computer Science, 21-25 July 2025

	Monday	Tuesday	Wednesday	Thursday	Friday
9:00 - 13:00	**Course 1** **E. Öztürk** Aula Magna Fisica	**Course 1** **F. G. Düzgün** Aula Magna Fisica	**Course 2** **J. R. Rodríguez Galván** Aula Magna Fisica	**Course 3** **R. Díaz Fuentes** Aula Magna Fisica	**Training sessions** **Homework control** Aula Magna Fisica
13:00 - 14:00	**Lunch**				
14:00 - 16:00	**Course 1** **F. G. Düzgün** Aula Magna Fisica	**Course 1** **E. Öztürk** Aula Magna Fisica	**Course 3** **R. Díaz Fuentes** Aula Magna Fisica	**Course 2** **J. R. Rodríguez Galván** Laboratorio M	**Excursion** **Social dinner**

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

- **Course 1:** *General Introduction to Ordinary Differential Equations and Applications to Real-World Models* (12h)
  Contents:
  - Some Types of Linear ODEs and Systems
  - Mathematical Modellings and Applications of Linear ODEs and Systems

  Lecturers: Eylem Öztürk (Hacettepe University), Fatma Gamze Düzgün (University of Cagliari)

- **Course 2:** *Some Types of Linear PDEs and Systems and Numerical Methods for PDEs* (6h)
  Contents:
  - Some Types of Linear PDEs and Systems: Boundary Value Problems and Modelling
  - Galerkin Methods for PDEs: Analysis, Implementation and Applications

  Lecturer: José Rafael Rodríguez Galván (University of Cádiz)

- **Course 3:** *Mathematical Modelling and Applications of PDEs and Systems* (6h)
  Contents:
  - Introduction to Second Order PDEs
  - From Laplace's Equation to Chemotaxis Systems

  Lecturer: Rafael Díaz Fuentes (University of Cagliari)