

# **Course ANNOUNCEMENT**

## WHO: PROF JOHN HOGAN Emeritus Professor, School of Engineering Mathematics and Technology University of Bristol S.I.Hogan@bristol.ac.uk

#### WHAT:

## Theory and Applications of Delay Differential Equations

#### WHEN:

Lecture 1: Monday, 19 May 2025, 9:00 – 11:00 Lecture 2: Tuesday, 20 May 2025, 14:00 – 16:00 Lecture 3: Friday, 23 May 2025, 14:00 – 16:00 Lecture 4: Monday, 26 May 2025, 9:00 – 11:00 Lecture 5: Tuesday, 27 May 2025, 14:00 – 16:00 Lecture 6: Friday, 30 May 2025, 14:00 – 16:00



WHERE: Room to be defined. The course will also be broadcast online (Link to the team)

HOW TO ENROLL: To enrol for the course, **it is necessary to join the course Team by Wednesday 14 May**, using this <u>Link</u> or using the Microsoft Team code **52ezygl** (valid only for users with @unina or @studenti.unina.it accounts). If you cannot access the team autonomously or need authorization, please contact <u>marco.coraggio@unina.it</u>.

**Abstract** — Why is it easier to balance a long stick on the end of your finger, but almost impossible to balance a short one? Part of the reason is the finite reaction (or delay) time of the brain and its actuation of the muscles in the body.

The presence of a delay in any system can completely change its behaviour. In this course, we will consider delay differential equations (DDEs). We shall see how even linear DDEs present significant challenges to analysis, both in terms of the problem definition and solution.

In this course I will talk about the two main methods used to solve DDEs: the methods of steps and the D-subdivision method, as well as providing many examples of DDEs in practice. By the end of the course, you will know how to classify DDEs, how to set up a DDE system correctly and how to find solutions of certain types of DDE.

You will also discover the critical length of stick that can be balanced on a finger.

**Biosketch** — John Hogan is an Emeritus Professor of Applied Mathematics in the School of Engineering Mathematics and Technology, University of Bristol. He is currently visiting professor at the Department of Electrical Engineering and Information Technology, University of Naples Federico II.

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