

Course on

Core modelling for transients

This course deals with the modelling of nuclear reactors in transient conditions, focusing on the modelling of neutron transport, heat transfer, fluid dynamics, fuel thermos-mechanics, and their interdependencies.

The **pedagogical format** of the course is based on a **hybrid flipped classroom**. In this format, you need to complete some **preparatory work** (representing about 40 hours of work) before attending **interactive classes** organized during 5 consecutive days (representing about 40 hours of work). Those classes are given in a hybrid set-up, with participants following the classes either onsite or remotely on the web. Research in engineering education demonstrated that such a teaching format leads to better learning outcomes and increases the interactions between the students and the teachers.

After the course you will be able to:

- Understand the principles of deterministic methods in non-steady-state conditions and of macroscopic modelling of nuclear thermal-hydraulics and fuel thermos-mechanics.
- Know the involved approximations and their range of validity.
- Apply various numerical techniques to solve linear and non-linear large system of equations, with special focus on multi-physics modelling.
- Implement such methods in modelling environments.
- Use coupled simulation software.
- Understand the outputs of such software.

In order to **pass the course** and be issued a **course completion certificate**, you need to obtain at least 50 points (out of 100 max. points). All activities (both during the preparatory work and the interactive classes) are graded.



The course is given by:

- Prof. Rafa Miró, Universitat Politècnica de València, Valencia, Spain.
- Prof. Sandra Dulla, Politecnico di Torino, Turin, Italy.
- Prof. Christophe Demazière, Chalmers University of Technology, Gothenburg, Sweden.
- Assoc. Prof. Diana Cuervo, Universidad Politécnica de Madrid, Madrid, Spain.
- Assoc. Prof. Carsten Lange, Technical University of Dresden, Dresden, Germany.
- Dr. Alessandro Scolaro, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland.

The interactive sessions are organized between January 8 and 12, 2024 at Universitat Politècnica de València, Valencia, Spain and on the web.

Register before October 29, 2023, 23:59 at:

great-pioneer.eu/register