

## Course on

# Core modelling for core design

*Did you know that the design and safe operation of nuclear reactors rely on computational simulations? Inside the nuclear reactor there is the core, and the neutron transport at the core level must be modelled to predict the reactor behaviour.*

**This course** aims to enable students to master the methods used for the neutron transport modelling at the core level in steady-state conditions using Monte Carlo and deterministic methods.

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 Monte Carlo and deterministic methods.
- Know the involved approximations and their range of validity.
- Implement such methods in simulation environments.
- Use codes to compute quantities of interest for core design & operation.
- Use the computational outcomes to analyse LWR core design & operation.

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. Nuria García-Herranz, Universidad Politécnica de Madrid, Madrid, Spain.
- Prof. Christophe Demazière, Chalmers University of Technology, Gothenburg, Sweden.
- Assoc. Prof. Máté Szieberth, Budapest University of Technology and Economics, Budapest, Hungary.
- Prof. Rafa Miró, Universitat Politècnica de València, Valencia, Spain.



The interactive sessions are organized between November 27 and December 1, 2023 at Universitat Politècnica de València, Valencia, Spain and on the web.

**Register before September 17, 2023, 23:59 at:**

[great-pioneer.eu/register](https://great-pioneer.eu/register)