GRE@T-PIONEER

Course on

Neutron transport at the fuel cell and assembly levels

This course focuses on the study of the transport of neutrons at the fuel cell and assembly levels, to provide useful information for the next steps of reactor physics analysis, such as the full core simulation in steady-state and transient conditions.

This course aims at providing the students with a sound understanding of the physical phenomena described by the neutron transport models, as well as giving the participants the instruments to perform numerical simulations of neutron transport with state-of-the-art models and codes.

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 physical phenomena described by the Boltzmann linear transport equation.
- Know the various numerical approaches typically adopted for the simulation of neutron transport.
- Implement some of those approaches in simulation environments.
- Describe the fundamental differences between the deterministic and the Monte Carlo methods for the solution of the transport equation.
- Use with confidence deterministic and Monte Carlo tools for the simulation of neutron transport.
- Appreciate the effects of the numerical approximations on the physical representation of the transport phenomenon.

This project has received funding from the Euratom research and training programme 2019-2020 under grant agreement No. 890675.

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. Sandra Dulla, Politecnico di Torino, Turin, Italy.
- Prof. Christophe Demaziere, Chalmers University of Technology, Gothenburg, Sweden.
- Assoc. Prof. Máté Szieberth, Budapest University of Technology and Economics, Budapest, Hungary.

The interactive sessions are organized between October 16th and October 20th, 2023 at Chalmers University of Technology in Gothenburg, Sweden and on the web.

Register before June 25, 2023, 23:59 at:

great-pioneer.eu/register