

Référence : 966

Durée : 28 heures (5j)

Lieu : INSTN de Cadarache

Méthodes et outils pédagogiques :



Reactor core physics: deterministic and Monte Carlo methods - International school in nuclear engineering

EN BREF

The course deals with advanced numerical methods to solve the Boltzmann equation for neutron transport. Most recent deterministic and probabilistic methods developed respectively in APOLLO2/APOLLO3 and TRIPOLI4 codes are exposed.

À QUI S'ADRESSE CETTE FORMATION ?

The doctoral course is designed for young researchers, PhD students, post-doctorates and engineers from nuclear industry companies, research centres, Universities, Technical Safety Organizations (TSO), regulatory bodies.

COMPÉTENCES VISÉES

- Describe the neutron interactions in a nuclear reactor.
- Compare the deterministic and probabilistic methods for solving the neutron transport equation.
- Identify the main sources of uncertainties in a neutronic calculation (deterministic or probabilistic).

PRÉREQUIS

Minimum background: Master of Science.

LES PLUS

The course is presented by three Senior Experts of the CEA involved for many decades in developing calculation schemes for fast and thermal reactor cores.

CONTENU

- Chain reaction and neutron balance.
- Transport equation and calculation schemes.
- Solving the steady-state integro-differential transport equation.
- Neutron slowing-down and resonance absorption.
- Verification & Validation of neutronics code packages.
- The Monte Carlo method.
- Monte Carlo techniques.
- Monte Carlo codes.
- Monte Carlo/Deterministic coupling and benchmarking.