

Self-evaluation sheet: nuclear fission

In order to successfully take the exam, a student should know

- Nuclear fission from a theoretical point of view: Bohr-Wheeler approach, limit of spontaneous fission
- Phenomenology of nuclear fission: energy balance, reaction products, *prompt* and *delayed* neutrons, cross sections for fissile, fissionable, and fertile elements, moderators and absorbers, activation energy, nuclear structure effects (pairing/shell)
- Chain reaction: critical conditions, neutron diffusion in the reactors, reactor equation, diffusion lengths, reactor kinetics, four factors formula,
- Nuclear reactors: structure, components and models (PWR, BWR to CANDU), *poisoning* elements (^{135}Xe)
- Uranium: fuel, enrichment and radioactive waste