

**PHYS 581 Nuclear Reactors Physics 3 (3+0):**

Neutron Physics: properties of neutrons, Neutron sources, nuclear reactions, BF<sub>3</sub> detectors.

Nuclear Fission by thermal neutron in homogenous reactors: Scattering Cross Section, Energy release from fission, Neutron yield, Reactor Criticality, Neutron cycle and the multiplication factor.

Neutron diffusion: Diffusion equation and its solutions.

The Critical equation in steady homogenous reactors: Diffusion equation applied to thermal for infinite and finite reactors, Fast neutron diffusion and Fermi age equation.

Heterogeneous Reactors: Effect of fuel distribution on the parameters of the multiplication factor, Non-steady nuclear reactors.