Nuclear Reactor Physics
FKFN10/FYST44

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http://www.nuclear.lu.se/utbildning/valfria_kurser/reaktorfysik/

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Introductory meeting

- General presentation
- Participant list
- Meeting time(s)
- (Neutron detector project – introduction)
- Literature:

  Lamarsh, J.R. and Baratta, A.J. Introduction to Nuclear Engineering. Prentice-Hall 2001, ISBN 0-201-82498-1.

  Material handed out during the course

About the course - aims

- deeper knowledge in nuclear reactor physics: the construction and function of modern reactors, theory of neutron physics, core design and fuel optimization.
- radiation protection and instrumentation for monitoring neutrons and emissions of radioactive gases and particles.
- introduce safety and risk evaluation for large and complex facilities

Skills and abilities

- understand and describe static and dynamic processes in a large reactor
- improved the ability to understand different aspects of nuclear physics from an experimental point of view
- write a paper that in a commenting and critical manner concludes published results of relevance to the course agenda

Teaching blocks

- Neutron detectors; theory and practice, short project (Kevin Fissum)
- Nuclear reactor engineering (Lamarsh - Baratta). Tutorials in small groups (Jan Pallon)
- Laboratory – The Sigma Pile/Neutron diffusion and moderation, reflection (Julius)
- Project suggestions
  - Core calculations/simulations in e.g. MATLAB
  - Accelerator Driven Systems
  - Reactor Physics – Breeder Reactor Technology.
  - Molten Salt Reactors
  - The future of thorium reactors (India as an example?)
  - Reprocessing of nuclear fuel
  - Transmutation of Spent Nuclear Fuel
  - Japanese reactor accident(s)
  - (Reactor) licensing policies in Sweden /EU/ IAEA.
- Optional: visit to Ringhals nuclear power reactor,