

UCH724 NUCLEAR TECHNOLOGY

L	T	P	Cr
3	0	0	3.0

Nuclear Reactions: Nuclear stability, Decay-ratio, Half-life, Fusion and fission reactions, Scattering, Cross-section, Absorption, Mean-free path, Chain reaction, Conversion and breeding, Neutronic cross section and core design.

Neutron Transport: Neutron current density, Steady-state diffusion equation, Diffusion length, Reciprocity theorem, Fermi-age theory, Reactivity and its dependence on various factors, Criticality of an infinite homogeneous reactor, Application of critical equation, Quasi-homogeneous reactors

Dynamic and Stability of Nuclear Reactor: Point kinetics, Exact and approximate solution without feedback, Feedback model, Concept of stability, Asymptotic stability with feedback.

Text Books:

1. John R. Lamarsh, J. R. and Anthony R. Baratta, A. R., Introduction to Nuclear Engineering, Prentice-Hall (2001).
2. El-Wakil, M. M., Nuclear Power Engineering, McGraw-Hill (1962).

Reference Books:

1. Glasstone, S. and Sesonske, A., Nuclear Reactor Engineering: Reactor systems engineering, Volume 2, Springer (1994).