

# Fusion Reactor Technology 1

(459.760, 3 credits)

1<sup>st</sup> Semester of 2011

Department of Nuclear Engineering

**Classroom:** Rm 32-108

**Time:** Monday, Wednesday 15:30 - 16:45

**Instructor:** Prof. Yong-Su Na (Rm 32-206, x 7204, ysna@snu.ac.kr)

**T.A.:** Wonjae Lee (Rm 31-117, x 8336, lwj2003@snu.ac.kr)

## Overview:

This course deals with key issues of fusion reactor technologies based on magnetic confinement, focusing on the tokamak concept. Overview of the fusion power plant system will be introduced and energetics of which will be addressed. Then, the way how to build and operate a tokamak is going to be covered. Plasma instabilities and plasma transport which limit fusion performance in a reactor based upon the tokamak concept will be touched upon in view of reactor core operation. The fusion technologies focusing on the heating and current drive and the plasma edge will also be introduced and their current status and main issues will be addressed.

## Textbook:

- B. B. Kadomtsev, "Tokamak Plasma: A Complex Physical System", Institute of Physics Publishing, Bristol and Philadelphia (1992)
- L. C. Woods, "Theory of Tokamak Transport - New Aspects for Nuclear Fusion Reactor Design", WILEY-VCH (2006)
- A. A. Harms, K. F. Schoepf, G. H. Miley, D. R. Kingdon, "Principles of Fusion Energy", World Scientific Publishing Co. Pte. Ltd. (2000)

## References:

- J. Wesson, "Tokamaks", Oxford University Press, 3<sup>rd</sup> Edition (2004)

**Evaluation Elements:**

- Attendance (10%), Homework & Presentation (30%),
- Midterm Exam (30%), Final Exam (30%)