NUCL 552   T TH

Instructor: M. Ishii
Office: NUCL 112C Tel: 494-4587
Office Hours: T Th

Text Book: N. Todreas & M. Kazimi, *Nuclear Systems I*
M. Ishii and T. Hibiki, *Thermo-fluid Dynamics of Two-phase Flow*

References: E. E. Lewis, *Nuclear Power Reactor Safety*
R. T. Lahey & J. J. Moody, The *Thermal Hydraulics of Boiling Water Nuclear Reactor*
L. S. Tong & J. Weisman, *Thermal Analysis of Pressurized Water Reactors*

Course Content:

1. Neutron Chain Reaction

2. Nuclear Reactor Systems

3. Safety Characteristics

4. Safety Assessment

5. Reactor Licensing

6. Introduction to Vector Calculus

7. Formulation of Thermal-Hydraulic Problems

8. Physical Laws and Balance Equations

9. Constitutive Relation and Closure Relation

10. Single Phase Thermal-Hydraulics

11. Fuel Thermal Transient and Melting

12. Two-Phase Flow Formulation
    - Homogeneous Flow
    - Drift Flux Model
    - Two-Fluid Model

13. Two-Phase Thermal-Hydraulics

Scaling, Critical Heat Flux, Flooding, Flow Instability, Flow Excursion, Post Dryout Phenomena, Critical Flow

14. Special Topics Important for Reactor Safety

Grading Basis (Tentative)

Homework	30%
Midterm Exam	30%
Final Exam	40%

- Homework
  Assignments will be due at the time stated when work is assigned, unless otherwise specified. Late homework will not be accepted for grade; however, all homeworks should be submitted before the end of the semester.

- Midterm and Final Exam will be closed book and notes.

- An A will be given if the total score is $\geq 85\%$. If the total grade is less than 50%, the grade will be F. The other grades will be determined after considering the class distribution.