Purdue University
School of Nuclear Engineering

NUCL 650 Thermal-Hydraulics for Nuclear Reactor Safety
T Th

Instructor: M. Ishii
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Textbook: M. Ishii, *Thermo Fluid Dynamic Theory of Two-phase Flow*, Eyrolles, Paris
N. Todreas & M. Kazimi, *Nuclear Systems I*

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 a grade; however, all homework 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 $< 50\%$, the grade will be F. The other grades will be determined after considering the class distribution.

Course Content
NUCL 650

1. Two-fluid Model
2. Interfacial Transfer Terms
3. Interfacial Area
4. Flooding Phenomena
5. Kinematic Wave Theory based on Drift Flux Model
6. Density Wave Instability
7. Flow Excursion & CHF
8. Interfacial Area & Nucleation Site Density
9. ECCS & Rewetting
10. Thermo-hydraulic System Scaling
11. Severe Accident Phenomena Scaling
12. Fuel Melting & Transport in FBR
13. Direct Containment Heating
14. Thermal Hydraulic Problems in Reactor Safety