Syllabus for AME 543

AME 543: **Nuclear Thermal Hydraulics**
Prerequisites: **Undergraduate Degree in Engineering**
Semester: **Fall 2013**
Time: **Tu 6:40 – 9:20 PM**
Professor: **Majid Motamed**

- **Office hours:** **By Appointment**
- **Phone and email:** **310-7394424, nuveenmo@usc.edu**
- **TA:** **None**

Course Requirements and Grades

- **Required text: "NUCLEAR SYSTEMS VOLUME 1 THERMAL HYDRAULIC FUNDAMENTALS(2nd Edition)," by NEIL E. TODREAS AND MUJID S. KAZIMI, ISBN: 978-1-4398-0887-0.**

Grading Breakdown:

Homework: **25%** **(projects)**
Mid-Term: **35%** **(October 8, 2013)**
Final: **40%**

Breakdown of Course Material

TOPIC	PERIODS	DATES	Textbook Chapters
Introduction Introduction; Reactor Thermal-Hydraulic Characteristics; Thermal Design Principles	1	8/27	1-2
Power Reactors Functional description and operational aspects of various Nuclear Reactors	2	9/3	Lecture notes, Power-Point
Thermal Analysis of Fuel Elements Fuel Element Heat Conduction; UO_2 Properties Temperature Distribution in Fuel Elements; Temperature Distribution in Redistributed Fuel Elements ; Fuel-Coolant Thermal Resistance	3-5	9/3-9/24	8
Mid-Term	6	10/1	
Single-Phase Flow Introduction and Mathematical Relations; Lumped Parameter Integral Approach ; Differential	7-8	10/8-10/15	4

Conservation Equations			
Two-Phase Flow Definitions; 1-D Transport Equations; Flow regime maps; 1-D flow models; Pressure drop	9-10	10/22- 10/29	5
Nuclear Reactor Systems and operations	**11**	11/5	Lecture notes, Power-Point
Reactor Safety Systems and Accident Analysis	12	11/12	Lecture notes, Power-Point
Boiling Heat Transfer	13-14	11/19- 11/26	12
Closure	15	12/15	
Final		TBA	