

Syllabus

MIE 1222 Multiphase Flow

Fall 2016

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Text: Chapters from
“Handbook of Atomization
and Sprays” Edited by:
N. Ashgriz Toronto

week	Date	Topic	Chapters ¹
1	Sept 13	Introduction to the Atomization and Spray Systems – Droplet generators and Spray nozzles	
		Governing Equations of Fluids	handout
		Surface Tension & Surfactants	handout
2	Sept 20	Kelvin-Helmholtz Instability	handout
		Instability of a Liquid Sheet - Examples	handout
3	Sept 27	Linear Instability of a Liquid Jet	1
4	Oct 4	Oscillations of a Liquid Droplet	5
		Flow past a spherical droplet	4, handout
5	Oct 11	Droplet Evaporation and Combustion - Examples in sprays	handout
6	Oct 18	Drop Deformation and Breakup	6
		Atomization Models	9
7	Oct 25	Droplet Collisions	handout
		Droplet Impacts	handout
8	Nov 1	Droplet dynamics	handout
		Discrete Particle Model	handout
9	Nov 8	Nucleation process	handout
10	Nov. 15	Cavitation	handout
11	Nov 22	Oscillation of Spherical Bubbles	handout
12	Nov. 29	Particle Size Distribution	handout
13	Dec. 6	Projects	

Final grade will be based on:

Homeworks:

1- Surface tension	10%
2- Sheet Instability	10%
3- Jet Instability	10%
4- Drag Calculation	10%
5- Drop Evaporation	10%
6- TAB modeling	10%

Final Project **40%**

¹ Chapters correspond to the chapters in the “Handbook of Atomization and Sprays”, edited by N. Ashgriz.