

SEOUL NATIONAL UNIVERSITY  
Department of Mechanical and Aerospace Engineering

## **Micro Fluid Mechanics**

Spring 2019

### **CLASSES**

*Lectures:* Tuesdays and Thursdays, 15:30 -16:45

*Lecturer:* Prof. Ho-Young Kim (Bldg 302 Rm 423, 02-880-9286, hyk@snu.ac.kr)

*Prerequisites:* Undergraduate background in fluid mechanics, heat transfer and elasticity, and elementary knowledge of physical chemistry and biology.

*Objectives:*

Providing students with firm analytical tools to understand microscale fluids and soft matter.

*Recommended references* (there is no textbook for this class):

1. G. K. Batchelor, *An Introduction to Fluid Dynamics*, Cambridge University Press, 1967.
2. P.-G. de Gennes, F. Brochard-Wyart, D. Quere, *Capillarity and Wetting Phenomena*, Springer, 2004.
3. R. F. Probstein, *Physicochemical Hydrodynamics*, Butterworth-Heinemann, 1989.
4. L. D. Landau and E. M. Lifshitz, *Theory of Elasticity*, 3rd Ed. Butterworth-Heinemann, 1986.

### **EXAMS & GRADING**

The course grade will be based on

1. mid-term exam (45%)
2. final exam (55%)

The grading policy is subject to change with a notice.

### **HOMEWORK**

Problem sets will be distributed occasionally but they are not to be turned in and graded. Solutions will be provided one week after each problem set is out.

## **TOPICS TO BE COVERED**

1. Introduction to micro fluid mechanics
2. Low-Reynolds number flows
3. Capillarity and wetting
4. Electrokinetics
5. Elasticity, elastohydrodynamics, and elastocapillarity
6. Introduction to soft matter