Department of Civil Engineering

National Cheng Kung University

Course Outline

- Title： Fluid Mechanics（流體力學）
- Type： Required for undergraduates
- Credit： 3
- Prerequisite： Physics, Engineering Mechanics, Engineering Mathematics
- Lecturer： Chung Fang
- Description： Fluid mechanics is that discipline within the broad field of applied mechanics concerned with the behavior of liquids and gases at rest or in motion. It is the very fundamental discipline to civil and other engineering sciences. After visiting the course, the participants are expected to have a fundamental but clear understanding of the mechanics of fluids, and are able to apply the discipline to practical problems.
- Contents：

Part I.

1. Mathematical prerequisites
2. Fundamental concepts
3. Hydrostatics
4. Flow kinematics
5. Balance equations
6. Dimensional analysis and model similitude
7. Special topics of fluid flows

- Textbook & References：

1. 方中, *基礎流體力學*, 滄海圖書, **2021**

Introductory level：

2. Fang, C., *An Introduction to Fluid Mechanics*, Springer-Verlag, 2019
3. Pao, RHF., *Fluid Mechanics*, Wiley, 1961
4. Pao, RHF., *Fluid Dynamics*, Merrill, 1967
5. Munson, D.F., Young, T.H., Okiishi, W.W., Huebsch, B.R., *Fundamentals of Fluid Mechanics*, 6th ed., Wiley, 2010

6. Cengel, Y.A., Cimbala, J.M., *Fluid Mechanics: Fundamentals and Applications*, McGraw-Hill, 2006
7. Fox, R.W., McDonald, A.T., Pritchard, P.J., Mitchell, J.W., *Introduction to Fluid Mechanics*, 9th ed., Wiley, 2016
8. Van Dyke, M., *An Album of Fluid Motion*, The Parabolic Press, 1982
9. 王懷柱, *揭開飛行的奧秘*, 4 版，全華, 2009

Advanced level：

10. Batchelor, G.K., *An Introduction to Fluid Dynamics*, Cambridge University Press, 2000
11. Lifshitz, E.M., Landau, L.D., *Fluid Mechanics*, 2nd ed., Butterworth-Heinemann, 1987
12. Aris, R., *Vectors, Tensors, and the Basic Equations of Fluid Mechanics*, Dover, 1962
13. Tritton, D.J., *Physical Fluid Dynamics*, 2nd ed., Oxford University Press, 1988
14. Currie, I.G., *Fundamental Mechanics of Fluids*, 2nd ed., McGraw-Hill, 1993

- Grading Policy： 1st Midterm exam(25%), 2nd Midterm exam(35%), Final exam(40%)
- Office hour： AM 08:00 – 10:00, Friday, Room 47248, CE Department (those of the TAs will be announced later)

Note: The lecture will be held in **English**.