

Syllabus of
Special Topics of Hydrodynamics Stability
(流體穩定學特論)

Instructor: Professor Falin Chen

Credit: 3

Hydrodynamics stability is a classical theme having been studied for decades and has since become an important and major issue of fluid mechanics, with which both the fundamental and application of fluid mechanics can be attacked. This course will provide opportunities for students to study the stability of several different fluid flows, such as boundary layer, jet, thin film, rotating fluid, convective flow, and so on. In the course, details of stability theories will be delivered, relevant numerical techniques will be exercised, and physical phenomena will be illustrated by experiments shown in multimedia environment. This course is offered to students who have taken undergraduate fluid mechanics and fundamental numerical computation. Those who are in graduate programs and are in sophomore and senior level can take this course for credit.

授課老師：陳發林 教授

學分數：3

流體穩定學是一門專門探討流體從層流轉變到紊流之相關變化的學科，過去數十年來一直都是流體力學最重要的研究主題之一。本課程將有系統的討論 3 數種不同流場的穩定性，譬如邊界層，噴流，薄膜流，旋轉流，自然對流，……，等等。從這些基本流場的穩定性分析可以瞭解所有相關的穩定學特性與原理，並學習到相關數值技巧來解決許多微分方程求解的基本困難。我們也會利用多媒體技巧所編排出的許多流體力學實驗結果，來討論如何辨識流體發生穩定性變化時的特性。本課程適合碩博士班研究生，和修過一門以上的基本流體力學課程和數值計算課程的大三或大四學生修習。