Instructor: ChanJi Calvin Lai,
PhD. Birmingham U. UK
Adjunct Professor
Em: laicj@mail.ncku.edu.tw

Department of Hydraulics and Ocean Eng.
Cheng Kung University

Course objectives and Outlines

Knowing OCF designing methods, and linking these methods with **SHP** project.

Course objectives

- Understanding theory of open channel flows, and the spatial and time scales of applying the theory.
- Adding abilities of designing practical **SHP** projects related to open channel hydraulics.
- Emphasizing engineer’s ethics and design SOP through term cooperating project.

Course layouts

- 1st week(09/27/2021): Introduction to course
- Reviewing fundamentals of open channel hydraulics; Model and governing equations
  1. Geometry and coordinates
  2. Classification of open channel flows, and scales,
  3. Some discussions on 1d, 2d, and 3d modelling and to the governing equations,
  4. Some uniform flow calculation
  5. **Examples of SHP projects, local and international**

Course layouts

- 2-3th week: 10/4;10/18 (4 hours)

Uniform flow, GVF computation and channel design.

1. Steady uniform flow.
2. Specific energy, specific momentum and control sections.
3. Governing equation and GVF profile classification.
4. GVF sketching.
5. Computation of GVF: directed and standard step methods.
6. GVF flow by numerical methods.

Course layouts

- 4^{th} – 6^{th} week: 10/25;11/01;11/08 (4hours)

Unsteady flow : method of characteristics MOC and computation

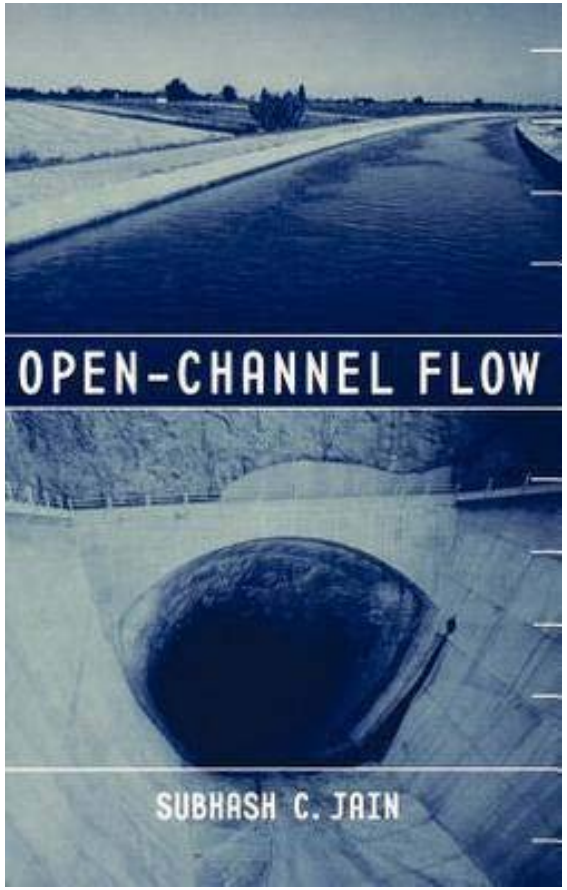
1. Propagation of disturbances and the moving control
2. From governing equation to equation of characteristics.
3. Properties, examples of MOC
4. MOC examples; Dam break problem using MOC
5. Numerical MOC.;MOC tutorial

Course layout

- 7th week: 11/08 **Final Exam of part A**

Course note and Referencing books

- **Text book**
- **Subhash C. Jain, Open-Channel Flow, Wiley&Son, 2001**
  (see sample pdf file, not to be distributed)



- **Reference books:**

- Sturm, Terry W. Open channel hydraulics, McGraw-Hill,2001

- Chaudhry, M.H., Open channel flow Springer Science,2ed,2008

Learning Evaluation

- Course participation: 25%
- Term examination 75%

Open channel flow is the first part of the intermediate hydraulics course, and is accounted for 50% of the total learning score.