

Short Course - Basic Principles of Open Channel Hydraulics

Presenter: Hubert CHANSON

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and

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Catholic University in Chile, Santiago, Chile

Scope

This course is for people with an interest in performing hydraulic calculations and developing an understanding of the principles of open channel hydraulic engineering. The general principles of basic fluid mechanics are reviewed and their application to open channel flows is developed discussed. The focus of the course is on free-surface flows of water.

This is a practical course, and the lecture material is supported with practical applications and worked examples.

Contents

1. Presentation
2. Fundamental principles
3. Open channel hydraulics of short frictionless transitions
4. Application of the momentum principle
5. Hydraulic engineering of long channels
6. Physical modelling, dynamic similarity, dimensional analysis
7. Unsteady open channel flows
8. Case studies

WHAT DO YOU GET?

- Hardcopy course notes
- Access to a world leading expert in hydraulic engineering
- Real international case studies and examples

WHO SHOULD ATTEND?

Scientists, professional engineers and engineering students who wish to gain some knowledge and expertise in basic open channel hydraulic engineering.

Textbook (TBC)

CHANSON, H. (2004). "The Hydraulics of Open Channel Flow: An Introduction." Butterworth-Heinemann, 2nd edition, Oxford, UK, 630 pages (ISBN 978 0 7506 5978 9). (in English)

CHANSON, H. (2001). "Hidraulica Del Flujo en Canales Abiertos", McGraw Hill Interamericana, División Universidad, Columbia (ISBN: 958-410-256-7). (in Spanish)

Note: the number of attendees will be limited.

Hubert Chanson is Professor of Civil Engineering at the University of Queensland, where he has been since 1990, having previously enjoyed an industrial career for six years. His main field of expertise is environmental fluid mechanics and hydraulic engineering, both in terms of theoretical fundamentals, physical and numerical modelling.

Professor Chanson leads a group of 5-10 researchers, largely targeting flows around hydraulic structures, two-phase (gas-liquid and solid-liquid) free-surface flows, turbulence in steady and unsteady open channel flows, using computation, lab-scale experiments, field work and analysis. Hubert has published over 850 peer reviewed publications. He serves on the editorial boards of International Journal of Multiphase Flow, Flow Measurement and Instrumentation, and Environmental Fluid Mechanics, the latter of which he is currently a senior Editor. He chairs the Organisation of the 22nd Australasian Fluid Mechanics Conference in Brisbane, Australia to be held on 6-10 December 2020.

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Dr Xinqian (Sophia) Leng is a postdoctoral research fellow at the University of Bordeaux (France) and a Honorary lecturer at the University of Queensland (Australia). Her research interests include experimental investigations of unsteady rapidly-varied open channel flows, computational fluid dynamics (CFD) modelling of bores and hydraulic structures, and field investigations of tidal bores. She authored 60 peer-reviewed papers, including 23 international scientific journal articles. Dr Leng is the recipient of the 2018 Baker Medal, Institution of Civil Engineers, UK for the paper in the journal Engineering and Computational Mechanics, Proceedings of the Institution of Civil Engineers, UK. She was awarded a 2019-2021 IDEX international research fellowship from the University of Bordeaux (France). Xinqian is actively involved in international collaborations with leading research institutions such as the University of Queensland, University of Bordeaux, Sichuan University and Zhejiang Institution of Hydraulics and Estuary (China), as well as interdisciplinary cooperation with industrial partners.

