

SHORT-COURSE ANNOUNCEMENT

Water waves for the nearshore dynamics

Prof. Maurizio Brocchini

21-23/28-30 March, 2023, starting 9:30, Room 160/3 Polo Belluschi

Course description:

The course provides a description of the fundamental role of water waves in all nearshore dynamics. Focus is on wave modeling, achieved through those approaches that are at the roots of the most applied solvers in the field of coastal engineering. The interplay between fundamental physical phenomena, their mathematical description and related numerical solution will be analyzed. Specific dynamics of interest will be described through the models introduced.

Tuesday 21st	Wednesday 22nd	Thursday 23rd	Tuesday 28th	Wednesday 29th	Thursday 30th
Introduction to nearshore dynamics. Formulation of the wave problem: linear waves	Depth-averaged models: nonlinearity, dispersiveness	Numerical solutions of the Nonlinear Shallow Water Equations and Boussinesq equations	Applications of depth-averaged models.	Wave-averaged models	Solutions for selected nearshore dynamics

Maurizio Brocchini is an expert in the hydrodynamics and morphodynamics of coastal, nearshore and estuarine waters. His main area of research is the mathematical and numerical modeling of shallow water flows. He graduated in Theoretical Physics, with full marks and honours, in 1989 at the University of Bologna (Italy). He earned his PhD in Applied Mathematics in 1996 at the University of Bristol (UK), under the tutoring of Prof. D.H. Peregrine. Currently, he is Full Professor of Hydraulics and Fluid Mechanics at the Università Politecnica delle Marche, Ancona, Italy. He was tutor for 18 PhD theses and for over 50 MSc theses. He managed and collaborated to 12 European Union funded projects, 5 international collaborative research projects and 6 national research projects funded by the Italian MIUR. He is Associate Editor of the scientific journals: Journal of Waterways Ports Coasts and Ocean Engineering, A.S.C.E. and Journal of Ocean Engineering and Marine Energy, Springer. He is also member of the Editorial Board of the following journals: Coastal Engineering, Elsevier; Journal of Hydrodynamics, Elsevier; Mathematical Problems in Engineering, Hindawi Publishing; Ocean Engineering, Elsevier. He is author/co-author of over 140 peer-review papers appearing on Scopus/ISI-listed international journals, with total citations of about 3600 and h-index of 33 (Scopus). He was awarded by the European Community a Marie Curie Fellowship for research in the years 1993-1996. Listed among the "World's Top 2% Scientists".

All interested people, particularly PhD students, are invited to attend the course