



Course: **Modelling and Simulation of Marine Vehicle Dynamics (4 hours)**

By A/Prof Tristan Perez^{1,2}

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The objective of this course is to introduce concepts and practices used in modelling and simulation for marine vessels (ships, offshore, and underwater vehicles). The audience targeted in this course consists of students, researchers and engineers in the areas of naval architecture, electrical, mechanical, and control engineering.

At the end of the course, participants would understand how models are used in ship performance evaluation and motion control design.

Course content

- Introduction to ship dynamics
- Equations of motion
- Hydrodynamics
- Environmental models: waves, wind, and current
- Surface vessels in waves
- Manoeuvring models
- Propulsion systems and control surfaces
- Overview of the Marine Systems Simulator (www.marinecontrol.org)

About the Speaker: Tristan Perez's research and principal interest is in the area of Mechatronics. He is a leading researcher on the topic of vehicle motion control in marine applications. During the past four years, the focus of his research has been on the integration of hydrodynamic design and motion control of marine structures with application to surface vehicles and ocean wave-energy converters. At present, he is dedicated to research on reliability assessment of control systems with application to robust autonomy of uninhabited aircraft systems. In addition to his academic work, he is the director of Advanced Control and System Dynamics (AC-SD.com). This is a research and consultancy division of Newcastle Innovation Ltd—the commercial arm of The University of Newcastle. ACSD provides consultancy services for industry in the areas of modelling and simulation of complex systems and control system analysis and design. For further information see <http://cdsc.org.au/TP/>

Date: September 9 15.30-19.30

Location: Aula 160\1, Facoltà di Ingegneria, Università Politecnica delle Marche, Via Brezze Bianche 12, 60131 Ancona

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