

# SUMMER SCHOOL

## HUMAN FACTORS FOR NAVAL ARCHITECTURE DESIGN FOR SAFETY



24 – 28 July 2023

### PROGRAMME

Venue:

Instituto Superior Técnico, Alameda Campus

**Objective:** This 5-day course focuses on the intersection of Ergonomics/Human Factors and Human-Centered Design in the maritime domain. It emphasizes the importance of designing for human needs in order to achieve safety, performance and well-being at sea. With a blend of lectures, discussions, hands-on exercises, and guest lectures, you will gain invaluable insights into theoretical knowledge, real-world insights from maritime environments, as well as with practical application of methods for Human-Centered Design. It takes students through the entire Human-Centered Design cycle, from planning and understanding the context of use, to designing, evaluating and refining solutions that meet user requirements.

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# PROGRAMME

## Day 1 – 24<sup>th</sup> July 2023

Location: Room VA5 | Time: 9:00h to 13:30h (4h)

Onsite Registration (from 8:45h until 9:30h)

FIELD STUDY

LECTURE: Understanding context of use: summary of the day's visit

## Day 2 – 25<sup>th</sup> July 2023

Location: Room VA5 | Time: 9:30h to 13:30h (4h)

LECTURE (2 hours)

- Definitions and key principles of ergonomics and human factors, human element
- Changes in the maritime industry
- "Human error" or design-related error?
- Hazard control measures
- Designing for safety: understanding worker capabilities
- Enclosed spaces; movements on ships
- Crew needs and expectations in accommodations

EXERCISE (2 hours): Crew roles

## Day 3 – 26<sup>th</sup> July 2023

Location: Room VA5 | Time: 9:30h to 13:30h (4h)

LECTURE (2h)

- Evaluating designs (including documentation, standards and regulations).
- Physical ergonomics
- Seasickness and ship movements

EXERCISE (2h including discussion): Exercise on how to avoid sea sickness through better ship designs. Three cases: bridges, engine control rooms, galleys

## Day 4 – 27<sup>th</sup> July 2023

Location: Room VA5 | Time: 9:30h to 13:30h (4h)

LECTURE (2h)

- Definition and dimensions of usability
- Applying human-centered design in ship designs (Tamar and Harvest Leader)
- Barriers to adoption of human-centered design in the maritime industry
- Human factors issues with physical workstations and human-machine interfaces inside bridges
- Ship accidents due to issues with human-machine interfaces

EXERCISE (2 h including discussion): Link analysis

## Day 5 – 28<sup>th</sup> July 2023

Location: Room VA5 | Time: 9:30h to 13:30h (4h)

LECTURE (1h)

- Workload, tasks, workflow (examples loading a ferry)
- Measuring workload

EXERCISE: Understanding the context of use: insight into the seafarers' world through research, then creating low-fidelity prototypes of maritime workspaces. The exercise includes playing out scenarios within the prototypes, and engaging in reflective discussions to analyze ergonomics, work flows, and potential improvements.

### Funding programme:

Iceland   
Liechtenstein  
Norway grants

### Operational Programme Entities:



## Biography notes of the Lecturers:

**Professor Margareta Lützhöft** Professor of Maritime Human Factors, is a master mariner, with a PhD in Human-Machine Interaction. Presently she is holding a position as Professor in the MarSafe group at the Western Norway University of Applied Sciences. Her research interests include human-centered design and the effects of new technology.

**Doctor Hedvig Aminoff** is a postdoctoral researcher at NTNU, with a background in Human-Machine Interaction. She is part of the Shore Control Lab and currently focusing on design for fire safety on Roro-ships within the Lash Fire project.

**Doctor Taufik Akbar Sitompul** is a postdoctoral researcher and a member of the Shore Control Lab at NTNU, Norway. His current research focuses on designing intuitive human-machine interfaces for remotely operated port cranes.

**Doctor Manuel Ventura** is a naval architect, researcher of CENTEC and lecturer of ship and small craft design topics at Técnico. His research topics include optimization methods applied to ship concept design, energy efficiency assessment and marine transport.

**Doctor Erik Styhr Petersen** is a naval architect, with a PhD in maritime usability engineering. Coordinating the OCEAN project ([www.ocean-navigation-awareness.eu](http://www.ocean-navigation-awareness.eu)) and researching design methodology, usability and the application of human-centered design in the maritime field. Is presently a senior researcher at the Western Norway University of Applied Sciences (HVL) as well as at the Norwegian University of Science and Technology.

## Language

The course will run entirely in English.

## Location of the Event

Courses will take place at the Room VA5, located at the Civil Engineering Building, Alameda Campus of Instituto Superior Técnico, Lisbon.



## Organized by



Universidade de Lisboa  
Centre for Marine Technology and Ocean Engineering

In collaboration with:



Western Norway University of Applied Science (HVL)



Norwegian University of Science and Technology (NTNU)

## Contacts

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