



Εθνικό Μετσόβιο Πολυτεχνείο

Σχολή Ναυπηγών Μηχανολόγων Μηχανικών

Επαγγελματικό Διατμηματικό Μεταπτυχιακό Πρόγραμμα “Marine Performance Engineer”

11 Απριλίου 2024

Ίδρυμα Ευγενίδου,
Αίθουσα Διαλέξεων (1^{ος} όροφος)

17:00 - 20:00

Image: Freepik



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“Marine Performance Engineer”

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17.00 - 20.00

17:00	Καλωσόρισμα - Έναρξη
17:05 - 17:15	Χαιρετισμός από τον Πρύτανη του ΕΜΠ, Καθηγητή κ. Ι. Χατζηγεωργίου
17:15 - 17:30	Παρουσίαση της Σχολής NMM και των ερευνητικών δραστηριοτήτων της Εισηγητής: Καθ. Κ. Μπελιμπασάκης
17:30 - 18:00	Παρουσίαση της πρότασης για το νέο επαγγελματικό Μεταπτυχιακό Εισηγητής: Γιώργος Δημόπουλος, Αν. Καθ. ΣNMM-ΕΜΠ
18:00 - 18:15	Μικρό διάλειμμα - Καφές
18:15 - 18:50	Παρουσιάσεις επιλεγμένων ερευνητικών της Σχολής πάνω σε θέματα του μεταπτυχιακού από μέλη ΔΕΠ της ΣNMM-ΕΜΠ
18:50 - 19:00	Διάλειμμα - καφές
19:00 - 20:00	Συζήτηση και αλληλεπίδραση με παρευρισκόμενους Πρόταση θεμάτων-ερωτήσεων από moderator - καταγραφή ανταπόκρισης
20:00	Συμπεράσματα - Λήξη

ερωτηματολόγιο: <https://forms.gle/RGeDtnPX5nAzoJ7y7>



Κώστας Μπελιμπασάκης
Σχολή Ναυπηγών Μηχ/γων Μηχ/κων ΕΜΠ

Marine Performance Engineer
11 Απριλίου 2024



Marine Performance Engineer

A proposal for a new NTUA Postgraduate Program

George Dimopoulos, Kostas Belibassakis

12/4/2024

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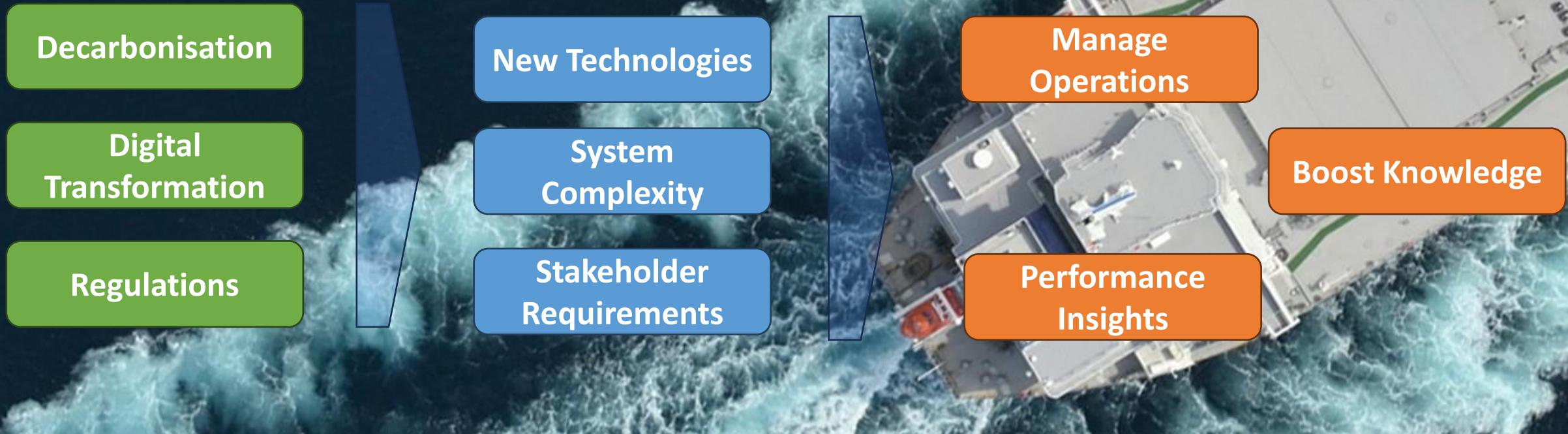
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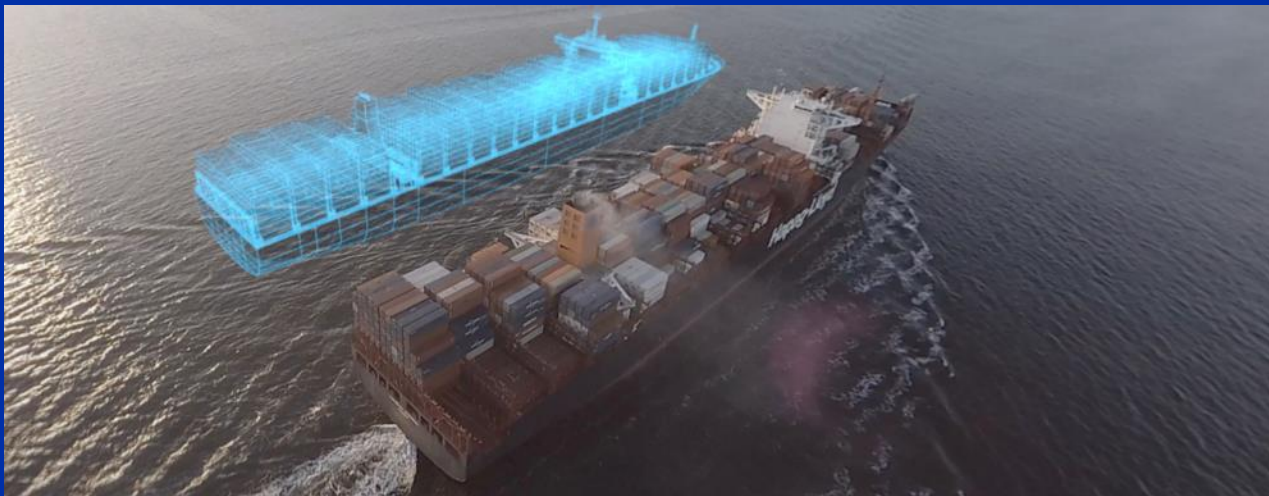


01 Motivation



01 Motivation

Why a Performance Engineering Postgraduate course?



Currently there is no other similar postgraduate specialization program!



Ship Performance is now a critical task for shipping companies.



Competitive Industry and performance improvements are essential to reduce costs.



Cargo owners and charters monitor and require performance reporting.



Decarbonisation & regulations requirements for the use and analysis of data coming from ships.



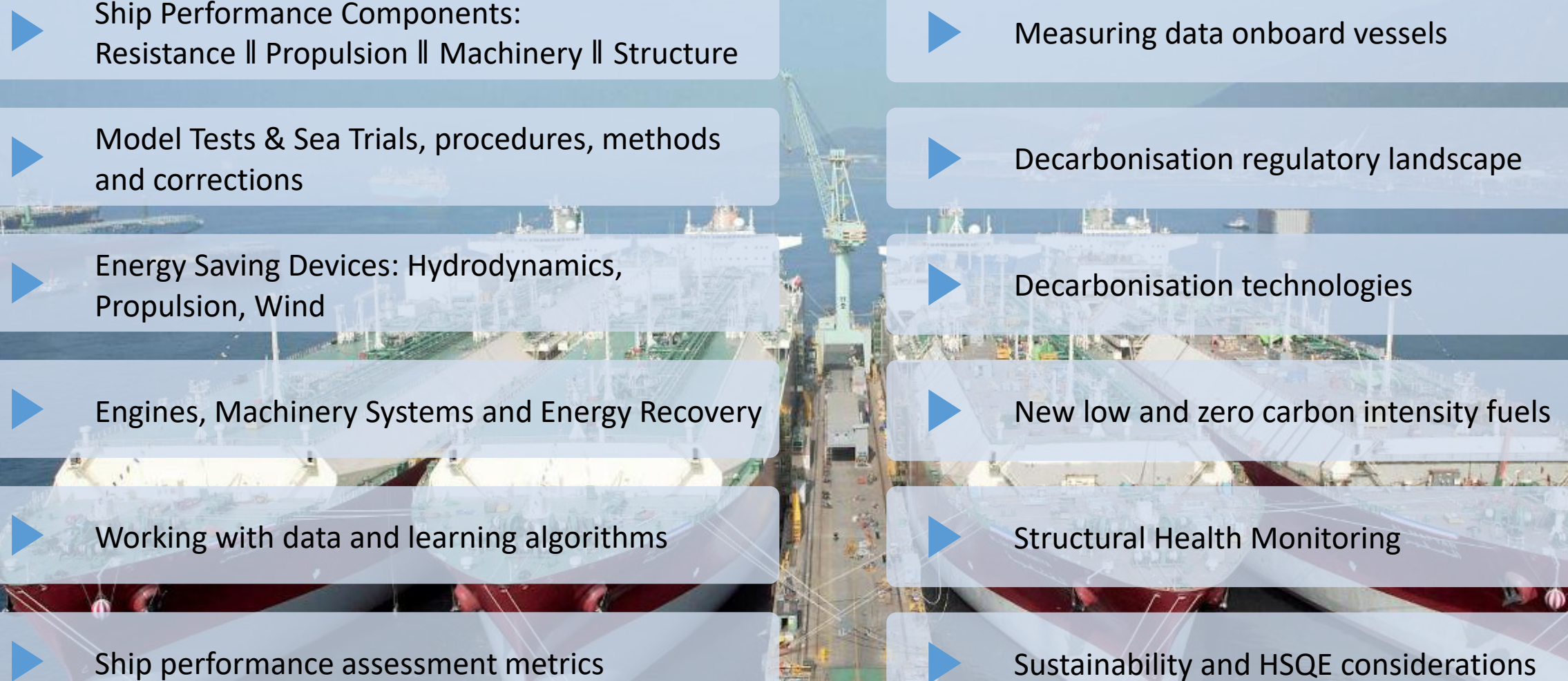
Currently ad-hoc solutions, structure, systematics and methods to address ship performance.



Significant need for a systematics and knowledge for effective ship performance management.



02 Learning objectives

- 
- ▶ Ship Performance Components: Resistance || Propulsion || Machinery || Structure
 - ▶ Model Tests & Sea Trials, procedures, methods and corrections
 - ▶ Energy Saving Devices: Hydrodynamics, Propulsion, Wind
 - ▶ Engines, Machinery Systems and Energy Recovery
 - ▶ Working with data and learning algorithms
 - ▶ Ship performance assessment metrics
 - ▶ Measuring data onboard vessels
 - ▶ Decarbonisation regulatory landscape
 - ▶ Decarbonisation technologies
 - ▶ New low and zero carbon intensity fuels
 - ▶ Structural Health Monitoring
 - ▶ Sustainability and HSQE considerations



02 Learning objectives

Focus will be on the practical issues of ship performance management: methods and tools to address them.

The program will serve as a specialization to give graduates a working knowledge on ship performance.

Close collaboration with the industry will guide the program's output to the practical aspects of ship performance.

New and emerging digital tools and technologies will be used / demonstrated and explored in real-world setups.



03 Target audience

25 -30 Students / per year

Maritime Industry Professionals

Early Graduates wanting to specialize

Engineering disciplines (indicative):

- **Naval Architecture and Marine Engineering**
- **Mechanical Engineering**
- **Electrical Engineering**
- Chemical Engineering
- Computer Engineering
- Applied mathematics



04 Proposed Curriculum



04 Proposed Curriculum

Semester 01



Semester 02



Semester 03

Courses:

Title
Resistance and Propulsion
Computational Hydrodynamics and energy saving devices
Engine and Machinery Systems Performance and New Technologies
Data analysis and machine learning for ship performance engineers
Assessment of Ship Performance and Efficiency
Analysis of Measurements at the Laboratory and Onboard
Guest lectures from the maritime partners

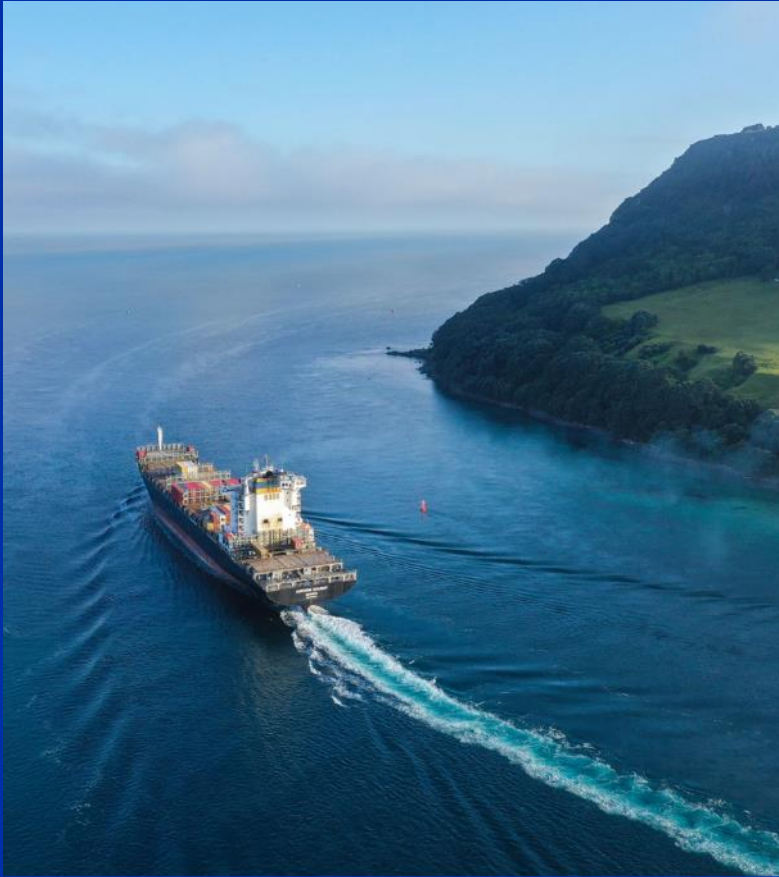
Title
Decarbonisation Technologies, Fuels and Electrification
The use of modelling and simulation (digital twins) in energy efficiency improvement
Hull performance and structural health monitoring
Regulatory developments and lifecycle impact on ships
Sustainable shipping: ESG and HSQE dimensions of ship performance
Marine engine performance laboratory
Guest lectures from the maritime partners

Thesis

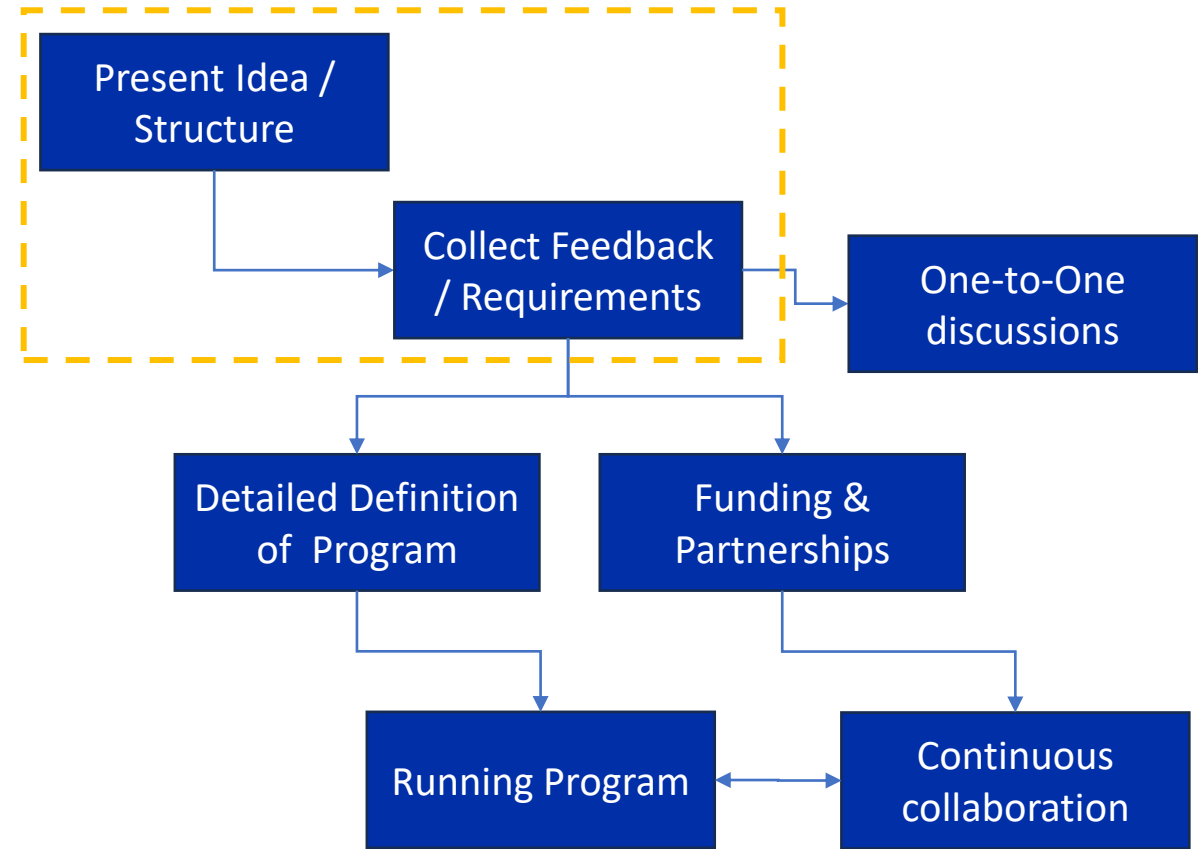
Course: 3 hours/ week
~ 3 courses per week
13 weeks per semester
Total 90 ECTS



05 Industry Engagement



Expected Start: September 2025



- ☐ Industrial Postgraduate Program.
- ☐ Maritime partners – participation.
- ☐ **Form an advisory board.**
- ☐ Dissertations according to needs / support.
- ☐ Pool of candidates for performance departments.

Concluding Remarks

Aiming at a new era of closer Greek maritime industry / NTUA collaboration

SNAME / NTUA high calibre research and education addressing the needs of our Maritime Industry

Performance Engineer Postgraduate Program: a first tangible step to serve the Greek Shipping Community

Marine Performance Engineer

A proposal for a new NTUA Postgraduate Program