Εθνικό Μετσόβιο Πολυτεχνείο
Σχολή Ναυπηγών Μηχανολόγων Μηχανικών

Επαγγελματικό Διατμηματικό Μεταπτυχιακό Πρόγραμμα
“Marine Performance Engineer”

11 Απριλίου 2024
Ιδρυμα Ευγενίδου,
Αίθουσα Διαλέξεων (1ος όροφος)
17:00 - 20:00
Εθνικό Μετσόβιο Πολυτεχνείο
Σχολή Ναυπηγών
Μηχανολόγων Μηχανικών

Επαγγελματικό Διατμηματικό
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"Marine Performance Engineer"
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17:00 - 20:00

17:00  Καλωσόρισμα - Εναρξη
17:05 - 17:15  Χαιρετισμός από τον Πρύτανη του ΕΜΠ, Καθηγητή κ. Ι. Χατζηγεωργίου
17:15 - 17:30  Παρουσίαση της Σχολής ΝΜΜ και των ερευνητικών δραστηριοτήτων της
Εισηγητής: Καθ. Κ. Μπελιμπασάκης
17:30 - 18:00  Παρουσίαση της πρότασης για το νέο επαγγελματικό Μεταπτυχιακό
Εισηγητής: Γιώργος Δημόπουλος, Ακ. Καθ. ΣΝΜΜ-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 ΣΝΜΜ-ΕΜΠ
18:50 - 19:00  Διάλειμμα - καφές
19:00 - 20:00  Συζήτηση και αλληλεπίδραση με παρευρισκόμενους
Πρόταση θεμάτων-ερωτήσεων από moderator - κατεγραφή ανταπόκρισης
20:00  Συμπεράσματα - Λήξη

ερωτηματολόγιο: https://forms.gle/RGeDtnPX5nAzoJ7y7
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Motivation

- Decarbonisation
- Digital Transformation
- Regulations
- New Technologies
- System Complexity
- Stakeholder Requirements
- Manage Operations
- Performance Insights
- Boost Knowledge
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.
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
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.
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

Courses:

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<th>Title</th>
<th>Title</th>
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<tr>
<td>Resistance and Propulsion</td>
<td>Decarbonisation Technologies, Fuels and Electrification</td>
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<td>Computational Hydrodynamics and energy saving devices</td>
<td>The use of modelling and simulation (digital twins) in energy efficiency improvement</td>
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<tr>
<td>Engine and Machinery Systems Performance and New Technologies</td>
<td>Hull performance and structural health monitoring</td>
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<tr>
<td>Data analysis and machine learning for ship performance engineers</td>
<td>Regulatory developments and lifecycle impact on ships</td>
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<tr>
<td>Assessment of Ship Performance and Efficiency</td>
<td>Sustainable shipping: ESG and HSQE dimensions of ship performance</td>
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<td>Analysis of Measurements at the Laboratory and Onboard</td>
<td>Marine engine performance laboratory</td>
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<td>Guest lectures from the maritime partners</td>
<td>Thesis</td>
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Semester 02

Semester 03

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