# FROM GREEN COLLEGE TO BLUE

NEW REQUIREMENTS UNDER MARPOL ANNEX VI ADOPTED BY GOVERNMENTS

# THE FUTURE OF MARITIME EDUCATION **A MULTIPURPOSE CURRICULUM APPROACH**

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## Recent Maritime Trend Overview 1. Adoption of MASS

- Many countries already started to aware and discuss on autonomous shipping.
  - India: Unmanned Ships in Indian Navy
  - Indonesia: Prototype MASS for Search & Rescue (SAR)
  - $\circ\,$  and more ..
- Leading Countries



• **Challenges**: Regulatory frameworks, cybersecurity, public acceptance.

Per the recent conference, the plan will not be updated until 2025 at the earliest. **Therefore, it's crucial that we stay closely connected to adapt effectively.** 



Source: UNESCAP Group Meeting in Pattaya, Thailand 2024



### Recent Maritime Trend Overview 2. Green Technology

#### The Shift from Conventional fuels to Alternative fuels





#### 2 KEY FACTORS SIGNALING THE ONSET OF GREEN SHIPPING:

1. Legal Framework	<b>IMO regulations</b> > MARPOL Annex VI (limits on sulfur and Efficiency Design Index).
2. Commercial Pressure	<b>EU ETS (Emission Trading Scheme) 2024</b> > Incentivizing e based mechanism.

#### Source: DNV Maritime Forecast to 2050

#### **Regulatory Timeline Towards 2030**

Key: Carbon Intensity Indicator (CII); Energy Efficiency Design Index (EEDI); Energy Efficiency Existing Ship Index (EEXI); Emission Trading System (ETS); Lifecycle Assessment (LCA); Ship Energy Efficiency Management Plan (SEEMP); Volatile Organic Compounds (VOC)

#### nitrogen oxide emissions), EEDI (Energy

#### emission reductions through a market-



### Recent Maritime Trend Overview 2. Green Technology



# While MASS and Green Tech promise a more efficient and sustainable future, **their adoption will** inevitably bring new challenges to the maritime industry.

Sources: IHSMarkit (ihsmarkit.com) and DNV's Alternative Fuels Insights for the shipping industry - AFI platform (afi.dnv.com)

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#### **Regulatory Timeline Towards 2030**





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### Key challenges in the post-adoption of MASS and Green Technology:

#### **TECHNICAL CHALLENGES**

- Reliability and safety of autonomous systems
- Integration of new technologies with existing infrastructure
- Cybersecurity threats and vulnerabilities

#### **ECONOMIC CHALLENGES**

- High initial costs of new technologies
- Potential impact on employment in the maritime sector
- Competition and market dynamics

#### **OPERATIONAL CHALLENGES**

- autonomous operations
- Training and upskilling the existing workforce, particularly in handling and
- and unmanned vessels

#### **REGULATORY CHALLENGES**

- and regulations

• Managing the transition from traditional to

- managing alternative fuels
- Ensuring safe interaction between manned

• Adapting legal frameworks to address autonomous vessels and new technologies • International harmonization of standards





### Key challenges in the post-adoption of MASS and Green Technology:

#### **TECHNICAL CHALLENGES**

• Reliability and safety of autonomous

#### **OPERATIONAL CHALLENGES**

As a maritime college, we embrace our responsibility to minimize the challenges facing future seafarers by preparing them for these transformative technologies.

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- Potential impact on employment in the maritime sector
- Competition and market dynamics

- and regulations

 Managing the transition from traditional to autonomous operations

• Adapting legal frameworks to address autonomous vessels and new technologies International harmonization of standards





### **Proposed Solution:**



# **Functional Analysis Method**



Identify <u>functions</u> seafarers need to perform (e.g., navigation, engineering, cargo handling).



Determine <u>competencies</u> required for each function (e.g., technical knowledge, problem-solving, decision-making).



Develop <u>a multipurpose curriculum</u> that covers essential competencies across multiple functions.



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### Functional Analysis Method: (1)

FUNCTIONS	COMPETE
1. Navigation	<ol> <li>Remote control of operations, logg from several sources</li> <li>Knowledge of cybersecurity</li> <li>Knowledge of engine functions and characteristics</li> <li>etc</li> </ol>
2. Cargo handling & operation	<ol> <li>Remote control of operations, logg from several sources</li> <li>Knowledge of cybersecurity</li> <li>In-depth technical knowledge to u systems</li> </ol>



#### INCIES

ging and analysing data

nd manoeuvring

ging and analysing data

understand complex

Source: Safety4Sea



### Functional Analysis Method: (2)

#### **FUNCTIONS**

#### COMPETENCIES

3. Machinery operations & maintenance

4. Maritime resource management

1. Ability to diagnose defects and rectify via automated systems 2. Advanced knowledge of electrical systems **3. Knowledge of cybersecurity** etc ...

1. Ability to manage teams and people working remotely and/or in dispersed teams

2. HR and knowledge management

3. Ability to coordinate and manage holistic and interdisciplinary approaches incorporating economic, social and ecological objectives

etc . . .



Source: Safety4Sea



### Functional Analysis Method: (3)

#### FUNCTIONS

### COMPETENCIES

#### 5. Safety

- 1. Understanding the basic concepts and properties of the different fuel types
- 2. Knowledge of fuel-specific chemistry and physics to understand potential safety hazards
- 3.Knowledge of potential hazards of the fuel on board and how these apply to equipment operation and maintenance etc . . .



Source: Safety4Sea









### Functional Analysis Method: (5)

**Multipurpose** Seafarer Curriculum





### To prepare seafarers for the digital transformation driven by MASS and Green Tech, a multipurpose curriculum equips them with a wide range of skills, ensuring adaptability in the evolving maritime landscape.



Asian Maritime Technological College

## "A vessel with incompetent seafarers is just as vulnerable as a ship in uncharted territory."

- Dr. Chalermvut Thansuvan President of AMCOL