ACADEMIA NAVALĂ „MIRCEA CEL BĂTRÂN”

A XV-a ediţie a sesiunii de comunicări ştiinţifice a studenţilor masteranzi

MASTER-NAV 2025

21 Februarie 2025
CONSTANŢA

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Marian RISTEA-KOMORNIKI

Vineri, 21 februarie 2025

Aula universitară "Viceamiral Ion Coandă"

10.00 - 10.10 *Deschiderea oficială a sesiunii de comunicări științifice Master-Nav 2025:*

- Ceremonialul ridicării Drapelului de stat;
- Mesajul Rectorului Academiei Navale "Mircea cel Bătrân".

10.10-10.50 *Sesiune plenară:*

- Drones - Innovative Technical Solutions for the Maritime Industry", autor: Andreea-Cătălina POP, îndrumător: Prof. univ. Dr. ing. Florin-Marius NICOLAE;
- Study on the Efficiency of Equipping Ships with Unconventional Energy Sources, autor: Ioan ȚUȚUIANU, îndrumător: Ș.L. Dr. ing. Ionel POPA;

10.50-11.00 *Poză de grup;*

11.00-16.00 *Prezentarea lucrărilor pe secțiuni.*

CUPRINS

ŞTIINŢE NAUTICE

BIROUL SECŢIUNII
Preşedinte: Conf. univ. Dr. ing. Sergiu LUPU
Membri: Ș.L. univ. Dr. ing. Sergiu ȘERBAN
Ș.L. univ. Dr. ing. Andra Teodora NEDELCU
Sala L3A6

1. Study on the Intervention of a T-22 Frigate in Maritime Search and Rescue Missions
Autor: stud. Vlad-Vasile ABICULESEI, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN
Abstract: The diploma project titled "Study on the Intervention of a T22 Frigate in Maritime Search and Rescue Missions" aims to address one of the most complex situations faced by specialists in the field of maritime search and rescue, namely the need to use a helicopter integrated aboard a ship for conducting search and rescue operations. Optimizing the maritime search and rescue process is the key to saving human lives at sea, a process that can last for several hours or even days. The faster the intervention, the higher the chances of survivors, and in performing such operations, time is the main enemy. The study conducted within this diploma project involves acquiring all the theoretical concepts related to this process, as well as understanding the legal framework in which these types of operations are carried out, coordinated by specialized structures. Through extensive research on how both national and international specialized literature addresses the topic and theme, the study seeks to highlight the benefits of using an airborne device aboard a military vessel.

2. Planning of Loading and Unloading Operations on a Container Ship

Autor: stud. Ștefania - Crina DINU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA

Abstract: The purpose of the paperwork is to show the importance of the correct planning of loading and unloading operations on a container ship. The content of the essay includes criteria and factors that contribute to the efficiency of handling goods in the loading and unloading process. These processes significantly influence transit times, operational costs and optimal utilization of vessel capacity so these operations are helping to maintain an efficient global economy and minimizing delays in supply chains.

3. The Impact of the Israel Conflict on Maritime Transport and the Global Economy

Autor: stud. Teodor-Ștefan DOGARU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA

Abstract: The ongoing conflict in Israel has significantly impacted maritime transport and the global economy. Disruptions in key shipping routes, particularly in the Eastern Mediterranean and the Red Sea, have led to increased freight costs, delays, and security concerns for commercial vessels. The geopolitical instability has also affected global supply chains, influencing trade flows, energy markets, and financial stability. Major shipping companies have been forced to reroute vessels or enhance security measures, leading to additional operational costs. Furthermore, investor uncertainty and fluctuations in oil prices have exacerbated economic volatility worldwide. The Suez Canal, a critical trade artery, faces potential disruptions, further straining global logistics. This paper explores the multifaceted effects of the Israel conflict on

maritime transport and its broader economic consequences, emphasizing the need for strategic risk management and international cooperation to mitigate long-term repercussions.

4. Hurricanes and the Impact of Climate Change

Autor: stud. Simona-Mihaela DUMITRACHE, Academia Navală „Mircea cel Bătrân", Constanța
Îndrumător: Ș.L. univ. Dr. ing. Andra NEDELCU

Abstract: This presentation explores the relationship between hurricanes and climate change, focusing on how global warming influences their intensity, frequency, and destructive potential. The presentation features case studies of major hurricanes such as Katrina, Ida, Dorian, and Maria, illustrating their devastating impacts on communities, economies, and ecosystems. These events underscore the growing risks posed by high-intensity storms in a changing climate. To further understand the impact of climate change on hurricanes, it is essential to recognize the role of human activities in amplifying these effects. Increased greenhouse gas emissions have led to higher atmospheric temperatures, which in turn affect weather patterns and contribute to more intense storms.

5. Planning and Management of Loading and Unloading Operations on an Oil Tanker

Autor: stud. Robert-Ionuț DUMITRU, Academia Navală „Mircea cel Bătrân", Constanța
Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA

Abstract: The efficient planning and management of loading and unloading operations on an oil tanker are essential for ensuring safety, environmental protection, and operational efficiency. This process involves meticulous preparation, adherence to international regulations, and coordination between ship and shore personnel. Key aspects include cargo planning, stability calculations, risk assessment, and emergency

response procedures. The use of advanced monitoring systems and compliance with MARPOL and SOLAS conventions help mitigate potential hazards such as oil spills and structural stress. Effective communication and crew training play a vital role in preventing accidents and ensuring smooth operations. This study examines best practices in planning and managing loading and unloading operations on oil tankers, emphasizing safety protocols, regulatory compliance, and technological advancements that enhance operational efficiency.

6. Integration of Augmented Reality Systems in Seafarers Training

Autor: stud. Mihnea Alexandru FOCȘENEANU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: The integration of Augmented Reality (AR) systems in navigator training enhances learning by providing interactive and immersive experiences. AR technology overlays digital information onto the real-world environment, improving situational awareness, decision-making, and operational efficiency. This approach enables trainees to simulate complex maritime scenarios, practice navigation techniques, and respond to emergencies in a risk-free setting. AR-based training reduces costs associated with traditional simulations while increasing engagement and knowledge retention. This paper explores the benefits, challenges, and future prospects of AR in maritime education, emphasizing its potential to revolutionize the training of navigators in an increasingly digitalized industry.

7. Study on Container Management in Maritime and Inland Ports

Autor: stud. Ana GEOGE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: The purpose of the paperwork is to evidence that container management is an essential component of modern logistics, having a significant impact on the efficiency of port operations. The content of the essay present impact of container management on port efficiency. Container management in a port involved a number of complex logistics processes including: storage, loading and unloading, transfer between various modes of transport by ship, train, truck, also document and information management.

8. Case Study for the Management of Marine Pollution Resulting from a Collision Between a Container Ship and a Bunker Barge

Autor: stud. Ana-Maria ÎNSURĂȚELU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing**.** Dinu - Vasile ATODIRESEI

Abstract: This presentation focuses on the details of the marine pollution incident that occurred in the Port of Singapore on June 14, 2024, when a container ship collided with a bunker barge. This incident led to significant fuel and chemical spills, causing considerable harm to the local marine ecosystem. Work describes the causes of the collision, the immediate environmental impact, and the response measures taken by authorities and involved parties. It highlights the serious short-term and long-term effects on water quality, marine life, and biodiversity. Furthermore, it emphasizes the need for robust safety protocols in the maritime industry, as well as rapid intervention strategies to mitigate environmental damage.

9. Operational Problems in the Maritime Transport of Liquefied Petroleum Gases (LPG)

Autor: stud. Alexandru-Iulian MARIN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Florin NICOLAE

Abstract: This paper explores the operational challenges faced in the maritime transport of liquefied petroleum gases (LPG). As global demand for LPG increases, efficient and safe transport by sea has become critical. However, various operational issues persist, including the need for specialized vessels, stringent safety regulations, and the complexity of handling volatile cargoes. Besides the technical failure and human error, geopolitical factors, such as port access restrictions and shipping lane congestion, can further disrupt supply chains. The paper discusses these challenges in detail, analyzing their impact on efficiency, safety, and overall industry performance. This paper provides an in-depth analysis on the operational problems encountered during ethylene gas transport. Addressing these problems is essential for the sustainable and safe transportation of LPG globally.

10. The Influence of the Russo-Ukrainian Conflict on Ship Voyage Planning

Autor: stud. Alexandru NEAGOE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA

Abstract: The ongoing Russo-Ukrainian conflict has significantly impacted global maritime logistics and ship voyage planning. Security concerns in the Black Sea and the Sea of Azov have led to disrupted shipping routes and increased insurance premiums for vessels operating in these regions. Consequently, ship operators are compelled to adjust their navigation plans, opting for alternative, longer routes to ensure crew and cargo safety. Port congestion and delays have further strained global supply chains, contributing to rising operational costs and extended delivery times. Additionally, regulatory changes and sanctions have complicated compliance procedures, requiring enhanced risk assessments and contingency strategies. The conflict has underscored the

vulnerability of maritime routes to geopolitical tensions, prompting stakeholders to prioritize flexible planning and real-time monitoring systems. In response, the shipping industry is increasingly investing in advanced technology solutions, such as AIS tracking and predictive analytics, to mitigate risks and optimize voyage planning amid uncertain conditions.

11. Study on the Manoeuvre of the Training ship "Mircea" Under Special Conditions

Autor: stud. Alexandru-Daniel NOAPTEȘ, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: This study examines the maneuvering of the Training Ship "Mircea" under special conditions, focusing on hydrodynamic effects that may impact the vessel's safety and control. A key factor is the squat effect, which occurs at higher speeds in shallow waters, reducing buoyancy and keel clearance, thus increasing the risk of grounding. The bank effect influences the ship's trajectory when navigating near shores or underwater obstacles, requiring constant course corrections. Additionally, the suction effect in channels and straits can lead to a loss of directional control, as pressure differences and lateral currents may pull the vessel towards the banks or nearby ships. These phenomena become even more pronounced in adverse weather conditions, where strong winds and high waves affect the stability and maneuverability of Training Ship Mircea. This study aims to identify effective navigation techniques and maneuvering adjustments to ensure the vessel's safety in such critical scenarios.

12. Navigation on the Danube

Autor: stud. Daria Georgeta POPA-NICA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. Dr. ing. Sergiu ȘERBAN

Abstract: The Danube, Europe's second-longest river, plays a crucial role in connecting Central and Eastern Europe through its 2,857-kilometer navigable route. This project examines the river's strategic importance in international trade, tourism, and ecological preservation. The theoretical section covers the Danube's characteristics, its integration into the European Transport Network (TEN-T), and navigation regulations under the Belgrade Convention of 1948. A case study focuses on the Vienna-Budapest route, analyzing navigation conditions, vessel specifications, and meteorological factors while employing Navi Planner BVS software for trajectory planning. The study underscores the river's economic and ecological value, highlighting its contributions to trade and biodiversity. Recommendations include modernizing infrastructure, implementing digital traffic systems, and promoting green technologies. The Danube is presented as a model for sustainable transport and regional cooperation.

13. Causal Chain Analysis Associated with Tanker Fires and Explosions

Autor: stud. Florin-Daniel SALCIANU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Florin NICOLAE

Abstract: The causal chain refers to the relationships between the various causes and conditions contributing to a specific event, in this case fires and explosions. Both technical, human and environmental factors are considered in this analysis process. On the one hand, equipment failures or technical errors, such as electrical short-circuits or inadequate ventilation of compartments containing flammable vapors, can lead to fires.

14. Study on Dynamic Positioning of Passenger Ships

Autor: stud. Ioana SMADICI, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Lect. univ. Dr. ing. Dumitru CORDUNEANU

Abstract: The study on dynamic positioning (DP) of passenger ships focuses on the advanced technologies and methodologies implemented to maintain a vessel's position and heading automatically without anchoring. As passenger ships operate in diverse and often challenging environments, effective DP systems are crucial for ensuring the safety and comfort of passengers while optimizing operational efficiency.

Dynamic Positioning Systems:

The study outlines various types of DP systems, including DP Class 1, 2, and 3, categorized based on their reliability and redundancy. Class 3 systems are designed for the highest safety levels, integrating multiple sensors and control systems to combat potential failures.

Technological Integration:

The integration of Global Positioning System (GPS), gyrocompasses, wind sensors, and radar systems is crucial for accurate positioning. These technologies work in tandem to provide real-time data, enabling the DP system to adjust thruster and propeller movements effectively.

Operational Challenges:

The research highlights several operational challenges faced by passenger ships, such as environmental factors (weather, currents, and waves) and mechanical failures. Strategies for system resilience and risk management are emphasized, including regular maintenance and operator training.

Case Studies:

Several case studies are presented, demonstrating successful DP operations in various maritime scenarios, including port approaches, refueling operations, and passenger transfers.

These cases illustrate the importance of situational awareness and decision-making in DP operations.

Future Trends:

The study discusses the future of DP technology, including advances in automation, artificial intelligence, and machine learning, which promise to enhance the capabilities of DP systems. The potential for hybrid power systems to reduce environmental impact is also considered.

Conclusion: This study underscores the significance of dynamic positioning in enhancing the operational reliability of passenger ships. By leveraging advanced technologies and addressing operational challenges, dynamic positioning serves not only to increase safety but also to improve the overall efficiency of maritime operations. Continuous development and training are essential to adapt to the evolving maritime landscape and to ensure the safe transportation of passengers at sea.

15. Digitalization and Automation of Ships: The Impact of Emerging Technologies on Maritime Transport

Autor: stud. Florin-Lucian SPIREA, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Conf. univ. Dr. Romeo BOŞNEAGU

Abstract: The digitalization and automation of ships represent an essential direction for increasing efficiency and safety in maritime transport. This dissertation analyzes the impact of advanced technologies, such as artificial intelligence, the Internet of Things (IoT), and autonomous systems, on ship operations and route optimization. The study explores the advantages of automation, including the reduction of human errors and operational costs, as well as the associated challenges, such as cybersecurity and international regulations. Through a comparative approach and case studies, the paper highlights current trends and the future of smart navigation,

emphasizing the need for the maritime industry to adapt to new technological innovations.

16. Study on the Methods of Salvage of a Stranded Ship in an Area with Maritime Protected Areas

Autor: stud. Alexandra Maria TOPLICEANU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Lect. univ. Dr. ing. Dumitru CORDUNEANU

Abstract: The study focuses on the various methods employed for salvaging stranded ships in regions designated as maritime protected areas (MPAs). It examines the unique challenges posed by environmental regulations and conservation efforts in these sensitive ecosystems. Key aspects include:

Assessment of Salvage Techniques: The study evaluates different salvage methods, such as lightering, refloating, and the use of specialized equipment, while considering their environmental impact.

Regulatory Framework: It outlines the legal and regulatory constraints that govern salvage operations within MPAs, emphasizing the need for compliance with conservation laws.

Environmental Considerations: The research highlights the importance of minimizing ecological disturbance during salvage operations, proposing best practices to protect marine biodiversity.

Case Studies: The study may include case studies of past salvage operations in MPAs, analyzing their effectiveness and the lessons learned.

Recommendations: Finally, the study provides recommendations for improving salvage strategies in MPAs, balancing maritime safety with environmental protection.

This summary encapsulates the core themes and objectives of the study, focusing on the intersection of maritime operations and environmental stewardship.

17. Maneuvering of the T22-Type Warship in the Specific Context of Transiting the Suez Channel

Autori: stud. Daiana-Maria VĂDUVA, stud. Ioan-Adrian ALRADI, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: This study analyzes the maneuvering of the T22 type warship, "Regele Ferdinand", during its transit through the Suez Channel, considering the unique characteristics of this strategic maritime passage. The research examines hydrodynamic effects such as squat, bank, and suction effects, which impact navigation in shallow and confined waters. It also details standard procedures for transit, including pilotage requirements, traffic separation schemes, and vessel preparation. The study highlights the importance of compliance with international regulations, including the 1888 Constantinople Convention, and the critical role of the Suez Channel in global trade and military operations. Special attention is given to the challenges faced by naval vessels and the measures necessary to ensure safe and efficient transit. The findings underline the channel's strategic significance and the necessity of meticulous planning for successful navigation.

18. Optimization of Renewable Energy Use in Maritime Transport

Autor: stud. Eduard Alexandru ANDREI, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: The maritime transport sector is undergoing a transformation towards sustainability, driven by the need to reduce greenhouse gas emissions and comply with international environmental regulations. This dissertation examines the current state of renewable energy utilization in shipping, focusing on technologies such as wind-assisted propulsion, solar panels, biofuels, and hybrid-electric systems. These

solutions are analyzed in terms of efficiency, economic feasibility, and environmental benefits. The study also highlights challenges, including high investment costs, technological integration barriers, and regulatory constraints. By assessing current implementations and future prospects, this research aims to identify optimization strategies for increasing the share of renewable energy in maritime transport. The findings contribute to a better understanding of how innovative energy solutions can enhance efficiency and sustainability in the sector, supporting the transition towards greener shipping.

19. Loss of Cargo from Container Ships – A Source of Marine Pollution

Autor: stud. Cosmin-Alexandru APOSTOIU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Florin NICOLAE

Abstract: Maritime transport is essential for global trade, but the loss of containers at sea is a serious environmental issue. Factors such as extreme weather conditions, overloading, or improper securing of containers can lead to them falling into the ocean. Once lost, containers and their cargo can have significant consequences on marine ecosystems. Hazardous chemicals, plastics, and other transported waste can pollute the waters and harm biodiversity. Additionally, sunken containers can become dangerous obstacles for navigation. Besides the ecological impact, cargo loss also results in major economic losses. To reduce risks, strict measures must be implemented to secure containers properly and improve their monitoring along maritime routes. Addressing this issue requires international cooperation and stricter regulations within the shipping industry.

20. Study on Risk Management Strategies in Severe Weather Conditions

Autor: stud. Robert-Andrei-Nicolas BARBU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Andra-Teodora NEDELCU

Abstract: In this study it is discussed one of the most challenging issues that concerns the officers responsible for operating the ship - severe weather conditions that pose significant risks to the ship`s infrastructure and human safety. This paper analyzes various risk assessment methodologies and management strategies used in extreme weather conditions, focusing on prevention, preparedness, response, and recovery and aims to show how effective risk management strategies are essential to mitigate the threats and enhance resilience.

21. The Identification of Causal Factors That Determine the Safety of Transport on Inland Waterways.

Autor: stud. Octavian Nicolae BOBE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Florin NICOLAE

Abstract: The safety of transport on inland waterways is influenced by a variety of factors, which are crucial to understanding and mitigating risks. This study aims to identify and analyze the key causal factors that affect the safety of inland waterway transport. These factors include environmental conditions, vessel design and maintenance, navigational infrastructure, regulatory frameworks, and human factors such as crew training and operational practices. By assessing these elements, the research highlights areas where improvements can be made to enhance safety standards. The findings will provide valuable insights for policymakers, industry stakeholders, and researchers working to improve the safety and sustainability of inland waterway transportation.

22. Reducing the Carbon Footprint by Introducing Methanol-Powered Vessels

Autor: stud. Ligia Anamaria CHEIAUA, Academia Navală „Mircea cel Bătrân", Constanța
Îndrumător: Conf. univ. Dr. ing. Dinu ATODIRESEI

Abstract: In this study, I explore the potential of reducing the carbon footprint in the shipping industry by introducing methanol-powered vessels. The maritime sector is a significant contributor to global carbon emissions, and as environmental concerns grow, the need for sustainable alternatives to conventional fuels becomes more pressing. Green methanol, produced from renewable sources, offers a promising solution by replacing fossil fuels and significantly lowering emissions of carbon dioxide and other pollutants. Transitioning to methanol-powered vessels not only supports global climate goals but also utilizes existing engine technologies with minimal modifications. While challenges such as scaling production and ensuring availability remain, I believe that the adoption of green methanol is an essential step toward a more sustainable and decarbonized maritime future. For this research, two vessels from Maersk were used as case examples: one powered by conventional fuels and the other by green methanol.

23. The Maneuver of a Bulk Carrier Ship in Bad Weather

Autor: stud. Alexandru-Ionuț CLINCIU, Academia Navală „Mircea cel Bătrân", Constanța
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: The maneuvering of bulk carriers in adverse weather conditions presents significant challenges for navigators. These vessels, designed for transporting bulk cargo such as ores, grains, or coal, are highly susceptible to rough seas, strong winds, and poor visibility. Harsh weather conditions can impact vessel stability, increase fuel consumption, and complicate maneuverability. Officers must possess advanced

meteorological and oceanographic knowledge to ensure safe navigation. Techniques such as adjusting speed, optimizing course angles, and utilizing modern navigation equipment are crucial for minimizing risks. Case studies, like that of the ROZTOCZE ship, highlight the significant impact of wind and waves on large bulk carriers, demonstrating the necessity of strategic maneuvering and proactive risk management. The ROZTOCZE ship, due to its size and lack of a bow thruster, faces increased challenges in strong lateral winds, requiring careful adjustments in speed and course to maintain control.

24. Methods for Reducing Crew Stress and Fatigue on Board Maritime Ships

Autor: stud. Cristian CRISTEA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: Maritime crew members face significant stress and fatigue due to demanding work schedules and challenging onboard conditions. This study evaluates the impact of work programs on the physical and mental well-being of seafarers, highlighting the correlation between excessive workloads and reduced performance. Technological and organizational solutions are explored to improve working conditions, including automation, optimized shift patterns, and enhanced rest facilities. Implementing digital fatigue monitoring systems and structured wellness programs can help mitigate risks associated with prolonged stress. Organizational strategies, such as improved communication, mental health support, and regulatory adjustments, also play a crucial role in ensuring crew well-being. By integrating these approaches, shipping companies can enhance safety, efficiency, and overall job satisfaction on board.

25. Advanced Technologies for Marine Environment Monitoring and the Impact of Navigation Activities

Autor: stud. Alexandru-Nicușor CROITORU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: The marine environment plays an important role in maintaining global ecological balance, providing oxygen, food, and essential resources for numerous species, including human economic activities. However, maritime traffic expansion has intensified ecosystem degradation through noise and chemical pollution, habitat destruction, and the introduction of invasive species. This study explores the impact of maritime traffic on marine ecosystems and the advanced technologies used for monitoring and mitigating its effects. Underwater sensors, autonomous drones, and remote sensing systems are analyzed as key tools for assessing pollution and protecting biodiversity. Special attention is given to the effects of underwater noise on marine mammals and the contamination caused by ballast water and fuel emissions. The study also examines international regulations and sustainable solutions for reducing maritime pollution. By integrating technological advancements with policy measures, this research highlights innovative approaches to preserving the marine environment and ensuring the sustainability of maritime activities.

26. Study on the Influence of Seawater Physio - Chemical Parameters on Ships

Autor: stud. Liviu-Ilie DEACONESCU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Andra-Teodora NEDELCU

Abstract: This dissertation analyzes the impact of seawater's physio-chemical parameters on ships, focusing on corrosion, biofouling, and structural integrity. Key factors such as salinity, pH, temperature, dissolved oxygen, and chemical composition

play a crucial role in the deterioration of ship hulls and onboard systems. The study examines how these parameters accelerate material degradation, increase maintenance costs, and affect vessel performance. Through laboratory experiments and case studies, the research identifies the most damaging elements and proposes mitigation strategies, including protective coatings, cathodic protection, and material selection. Understanding these interactions is essential for enhancing ship durability, reducing operational risks, and improving maritime sustainability. The findings aim to support shipbuilders, engineers, and marine operators in developing more resilient vessels adapted to varying seawater conditions.

27. Short Historical Insight of the Sets of Rules Preceeding COLREG 1972

Autor: stud. Ștefan DIAMANDI, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: Seeking an explanation for the nature of the Rules of Collision Avoidance, I have looked into their origins and compared the 1972 rules to their predecessors in the 1960 COLREG, the 1948 ones and went further up-stream to the source as far as I could reach chronologically. The first known compilation of sea laws is owed to the Phoenician colony of Rhodos. Due to obvious concerns with the limitations of this presentation, I will focus only on a few examples relating to the vestigial character of COLREG responsibility between vessels.

28. Study on the Impact of Maritime Transport on the Marine Environment

Autor: stud. Alexandru-Andrei FUCIGIU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: Maritime transport is essential for global trade but poses significant environmental risks. This study explores the impacts of shipping on the marine environment, including pollution from oil spills, ballast water, and chemical discharges. These pollutants harm marine biodiversity and ecosystems. Additionally, vessel noise and traffic disrupt marine species, particularly mammals. Greenhouse gas emissions from ships contribute to climate change and ocean acidification. The study reviews international regulations like MARPOL and discusses sustainable solutions such as cleaner fuels and advanced waste management. It emphasizes the need for global cooperation among governments, industries, and environmental groups to mitigate these impacts. By adopting stricter regulations and innovative technologies, the maritime sector can reduce its environmental footprint while supporting global trade. This research highlights the urgent need for sustainable maritime practices to protect marine ecosystems.

29. Study on Managing and Reducing the Risk of Fatigue in the Ship's Hold

Autor: stud. George-Alexandru GRĂDINARU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: In this study the author is going to talk about different ways of reducing the risk of fatigue as pe ISM code and SOLAS, respecting the rest hours of a person on board as well as the accommodation the person has onboard and the food quality and quantity he has while him time spent onboard.

30. Fire Risk Analysis for Military Ships

Autor: stud. Ștefan Petre ISTRATE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Florin NICOLAE

Abstract: In the missions of naval forces units of any state, establishing an optimal level of risk exposure is a priority, as the objective of completely eliminating risk exposure may affect the potential to achieve combat objectives. Under these conditions, the concept of risk is an important aspect for understanding operational conditions. From this perspective, this study will aim to assess operational risk to support decision-making in the design of a military ship. Studies and research in this field reveal that fire is a common cumulative consequence resulting from a hit sustained during a combat mission, being the cause of over 80% of recorded losses of military ships. Therefore, the analysis I will conduct will highlight the fact that fires on board a military ship can be determined and quantified using both qualitative and quantitative methods. Based on these methods, for various scenarios, the maximum foreseeable consequences can be identified, an aspect that will emphasize the added value and contribution of the scientific approach I have undertaken.

31. Waste Management on Board Ship Regarding Maritime Pollution

Autor: stud. Andrei Lucian IVAN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: Marine pollution is one of the most serious threats to marine ecosystems and global biodiversity. The ocean covers more than 70% of the planet surface and plays an essential role in regulating the climate, producing oxygen and providing natural resources. However, human activities, especially sipping, generate significant amounts of waste that end up in the world seas and oceans, affecting marine life and the health of aquatic ecosystems. In this context, waste management on board ships is essential to reduce marine pollution. Maritime transport is a vital sector for global trade, but at the same time,

it contributes significantly to ocean pollution by releasing waste of various types: solid waste, oils, hazardous substances and plastic waste. According to international statistics, waste from ship is a major source of water pollution and its management remains a significant challenge globally. Implementation of effective strategies to reduce marine pollution through proper waste management on board ships priority areas for both international authorities and the maritime industry.

32. Study on The Impact of the Russian-Ukrainian War on Maritime Traffic in the Black Sea

Autor: stud. Theodor-Georgian LESNIC, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU
Abstract: The Russian-Ukrainian war has profoundly affected maritime traffic in the Black Sea, disrupting trade routes, port operations, and regional security. This study examines shifts in shipping patterns, the implications of naval blockades, and the escalating risks posed by military activities. The findings indicate a notable decline in commercial traffic, the redirection of key trade flows, and increased operational costs for shipping enterprises. Furthermore, the conflict has intensified geopolitical tensions, shaping regional maritime governance and security policies. This research contributes to the understanding of the broader implications of geopolitical conflicts on global trade and maritime stability.

33. Docking of a RO-RO Cargo Vessel at Rotterdam Broekman Botlek Terminal

Autor: stud. George LUNGU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN
Abstract: The following work intends to present the docking procedure of a RO-RO Cargo vessel at the Broekman Botlek

terminal in the Port of Rotterdam, from the point of view of Bridge operations, actions and maneuvers carried out by OOW, pilot and Master – starting from pilot boarding at Maas Center Buoy, river passage, entering the Calandkanaal and docking at the terminal.

34. Study on the Use of Alert Systems in Maritime Disasters Prevention

Autor: stud. Alexandru-Eugen LUPU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Andra-Teodora NEDELCU

Abstract: Maritime disasters pose significant threats to human life, the environment, and global trade. This study explores the role of alert systems in preventing such disasters, analyzing their theoretical and technological foundations, classification, and operational principles. Using recent statistical data from GNOME and ADIOS, the research examines common disaster types, contributing factors natural, technical, and human and the importance of crew training. Furthermore, the paper categorizes alert systems into local, regional, and global types, highlighting recent innovations such as AI integration and AIS cross-section analysis. A case study of a significant maritime incident assesses the effectiveness of alert systems, identifying lessons learned and areas for improvement. The findings emphasize the need for advanced technologies and enhanced crew preparedness to minimize risks. The study concludes with recommendations for future research and system improvements to strengthen maritime safety.

35. Maneuvering of Ro-Ro Ships for Entry, Berthing, and Operations in Various Weather Conditions

Autor: stud. Mihai MARCU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: The successful execution of port maneuvers requires a comprehensive and adaptive approach, tailored to specific navigational conditions. This process demands an in-depth understanding of the vessel's characteristics, such as dimensions, center of gravity, and sail area, which significantly influence maneuverability, particularly under strong winds or rough sea conditions. Effective planning must account for external factors, including marine currents, wind, water depth, and port configuration, as well as the optimal use of auxiliary propulsion systems, such as bow thrusters. The case study of M.V. Zenith Leader in Yokohama Port, Japan highlights the importance of precise coordination between the crew, pilot, and tugboats, alongside the integration of advanced technologies to navigate confined spaces and dynamic environmental conditions. Clear communication, continuous risk assessment, and adaptability to external factors are critical to ensuring the success of entry, berthing, and operational maneuvers in port, minimizing risks, and safeguarding the overall safety of operations.

36. Study on Obtaining the Deep-Water Anchoring Classification for Oil Tankers and Bulk Carriers

Autor: stud. Petru-Adrian MAREȘ, Academia Navală „Mircea cel Bătrân”, Constanța
Îndrumător: Ș.L. Dr. ing. Sergiu ȘERBAN

Abstract: This study explores the process of obtaining the **Deep-Water Anchoring** classification for oil tankers and bulk carriers. It examines the technical, operational, and regulatory requirements necessary for vessels to meet this standard. The research focuses on anchor design, seabed conditions, and stability criteria, ensuring safe anchoring in deep waters. Additionally, it analyzes classification society guidelines and international maritime regulations. The findings provide valuable insights for shipowners, engineers, and regulatory

bodies, facilitating compliance and enhancing maritime safety. By addressing key challenges, this study contributes to the efficient and secure operation of deep-water anchoring systems for large commercial vessels.

37. Navigating Success: An Analysis of Moodle's Effectiveness in Enhancing English for Specific Purposes Learning in the Maritime Sector

Autor: stud. Raluca MATEȘ, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: This paper examines the effectiveness of the Moodle platform in enhancing English for Specific Purposes (ESP) learning within the maritime sector. As a versatile open-source learning management system, Moodle addresses the unique communicative needs of maritime professionals who require proficiency in technical terminology and sector-specific conventions. The study highlights Moodle's capabilities in delivering customized content that aligns with the operational challenges faced by maritime personnel. By incorporating authentic materials, interactive exercises, and collaborative projects, Moodle fosters active user participation, which is crucial for effective ESP learning. The analysis reveals that while Moodle promotes user engagement through discussion forums and real-time interactions, challenges such as varying digital literacy levels and the asynchronous nature of online learning can hinder participation. Furthermore, the balance between fostering student autonomy and providing structured support is essential to maintain engagement. Despite these challenges, Moodle's capability to track student progress and adapt content delivery based on empirical data supports continuous improvement in language acquisition. The paper concludes that by effectively leveraging Moodle's features, maritime educators can enhance the learning experience,

improve communication skills, and ultimately contribute to operational efficiency in the maritime sector. This research underscores the importance of addressing potential barriers to participation to maximize the platform's benefits, thereby ensuring that it meets the specific language learning needs of maritime professionals.

38. Study on the Management of Marine Pollution Risks on Board an Oil Tanker in Situations of Contact with a Marine Mine. Case Study: Incidents in the NW Black Sea Area

Autor: stud. Bogdan Dumitru MIRON, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. Ing. Dinu ATODIRESEI

Abstract: This thesis presents a detailed study on the management of marine pollution risks in a specific context, namely on board an oil tanker vessel, in the event of contact with a marine mine. The paper analyzes the risks associated with such an incident, the environmental impact, as well as the preventive and corrective measures needed to effectively manage these risks. The case study focuses on incidents that occurred in the north-western area of the Black Sea, a region with significant geopolitical and ecological features. The study will address risk assessment methods, emergency response plans, and pollution reduction strategies following such incidents. Furthermore, the thesis examines the relevant national and international legislation, as well as best practices in the field, aiming to optimize the risk management process to prevent and reduce marine pollution caused by maritime accidents. The findings of this study can contribute to the development of more effective safety protocols for oil tanker vessels, with the goal of protecting the marine environment and ensuring the safety of maritime operations in high-risk areas.

39. Saving Lives at Sea. Analytical Study on The Optimal Search Methods and Procedures in SAR Operations

Autor: stud. Alexandru – Cătălin NICOLAE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. Dr. ing. Sergiu ȘERBAN

Abstract: This project presents an analytical study on the methods and procedures used in Search and Rescue (SAR) operations, as well as the optimization of search and research processes in SAR operations through the use of multiple ships and drone-type aircraft. Thus, we propose two new procedures involving the use of two ships and a drone. The project highlights the general aspects of sea search and rescue, emphasizing its importance in the maritime field. Additionally, the legislative framework of maritime search and rescue operations will be analyzed to highlight the reasoning behind this maritime branch. Furthermore, the methods and procedures of naval search will be explored, contributing to the improvement of sea search performance in rescue operations.

40. Mediterranean Cyclones in the Warm Season

Autor: stud. Eduard-Cristian NICULAE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Andra-Teodora NEDELCU

Abstract: Mediterranean cyclones are a key feature of the region's climate, influencing weather patterns, precipitation, and extreme events. In the warm season, these systems exhibit distinct characteristics compared to their winter counterparts, often being weaker but still capable of producing significant rainfall, thunderstorms, and strong winds. This presentation will explore the formation mechanisms of Mediterranean cyclones during the warm season, their typical trajectories, and the atmospheric conditions that favor their development. Additionally, it will discuss their impact on local weather, including heavy rainfall episodes that can lead to flash floods.

Case studies of notable warm-season Mediterranean cyclones will be analyzed, highlighting their meteorological characteristics and socio-economic effects. Understanding these systems is crucial for improving weather forecasting and mitigating potential hazards associated with their occurrence.

41. The spread of Contagious Diseases on Board Ships

Autor: stud. Silviu PASCA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: The spread of contagious diseases on board ships poses significant risks to crew members, passengers, and global maritime operations. This study aims to investigate the potential causes of disease transmission in maritime environments, focusing on factors such as inadequate ventilation, poor hygiene practices, and close-quarters living conditions. By analysing real-case scenarios and existing prevention measures, the research will identify key vulnerabilities and propose effective mitigation strategies. The findings will contribute to improving health and safety protocols on ships, ensuring better preparedness for future outbreaks.

42. Design, Operation and Safety of a Jack-Up Oil Rig

Autor: stud. Victor-Ioan PAVEL, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Lect. univ. Dr. ing. Corduneanu Dumitru

Abstract: A jack-up oil rig is a mobile offshore drilling unit designed for shallow waters, typically up to 500 feet deep. It features a floating hull with extendable legs that rest on the seabed, providing stability during drilling operations. This project aims to show the importance that this type of oil rigs has in the offshore industry.

43. Threats and Countermeasures in Air Defense for Romania's Fluvial Sector

Autor: stud. Cosmin-Alexandru PÎRCĂLABU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA
Abstract: As modern aerial threats evolve, securing Romania's fluvial sector becomes increasingly complex. The Danube, a vital strategic and economic artery, faces growing risks from unmanned aerial vehicles (UAVs), cruise missiles, and low-altitude precision strikes. This paper explores the dynamic threat landscape and evaluates the effectiveness of existing countermeasures, from advanced radar surveillance and layered air defense systems to rapid-response strategies. Emphasis is placed on enhancing interoperability with NATO defenses and integrating next-generation technologies to strengthen situational awareness and response capabilities. With adversaries leveraging asymmetric tactics and stealth technologies, adapting Romania's air defense posture is crucial. This study provides a comprehensive analysis of current vulnerabilities and proposes strategic solutions to fortify air defense in the fluvial zone. By bridging operational experience with emerging innovations, this research contributes to safeguarding Romania's critical riverine infrastructure against evolving aerial threats.

44. Navigation Condition in the North Atlantic Ocean

Autori: stud. Antonio Cosmin PISICA, stud. Alin-Leonard PISICA, Academia Navală „Mircea cel Bătrân", Constanţa
Abstract: The North Atlantic Ocean plays a crucial role in global maritime trade, hosting the world's busiest transoceanic routes. This study examines key factors affecting navigation in this region, including weather conditions, ocean currents, and international regulations. The North Atlantic Current significantly influences maritime operations by transporting

warm waters, impacting climate patterns, and dictating navigational strategies. Additionally, the region's complex weather systems, characterized by trade winds and high-pressure zones, present challenges for safe passage. The SOLAS North Atlantic rules, particularly the Ice Patrol regulations, ensure safer navigation in iceberg-prone areas. Understanding these elements is essential for optimizing maritime routes and improving safety in one of the world's most critical shipping corridors.

45. Study on Simulation-Based Training for the Operation of Port Tugboats

Autor: stud. Constantin Lucian PISICĂ, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: Simulation-based training plays a crucial role in preparing tugboat operators by providing a safe and controlled environment for skill development. This study analyzes the benefits of using advanced simulators in training, highlighting their impact on the safety and efficiency of port maneuvers. Through scenario-based training, operators improve their responses in critical situations, reducing the risks associated with navigation in confined spaces. The research includes a comparison between traditional training and simulation-based training, emphasizing advantages in terms of costs, training time, and knowledge retention. The study's conclusions underline the necessity of continuously integrating simulation technologies into maritime personnel training, contributing to the optimization of port operations and the enhancement of maritime safety.

46. Study on the Management of Marine Pollution Risks on Board an Oil Tanker in Situations of Armed Attack. Case Study: Incidents in the Red Sea Area

Autor: stud. Vlad-Liviu POP, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Conf. univ. Dr. ing. Dinu-Vasile ATODIRESEI

Abstract: This study examines the risks of marine pollution caused by armed attacks on oil tankers, focusing on incidents in the Red Sea, a critical maritime trade route increasingly exposed to security threats. The research identifies key pollution risks arising from structural damage, explosions, and oil spills, analyzing their environmental and economic impact. It also explores international safety protocols, emergency response strategies, and preventive measures such as ship protection systems, crew training, and spill containment solutions. A case study of attacks in the Red Sea highlights real-world incidents, response effectiveness, and areas for improvement. The findings emphasize the need for enhanced international cooperation, advanced monitoring technologies, and more efficient oil spill mitigation procedures in conflict zones. By addressing these challenges, the study aims to contribute to improved risk management strategies and better protection of marine ecosystems.

47. Using Augmented Reality (AR) for Training Maritime Search and Rescue (SAR) Teams

Autor: stud. Gabriel POPA, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: Search and Rescue (SAR) operations at sea require highly trained personnel capable of responding quickly and effectively to emergencies. Traditional training methods can be costly, risky, and limited in scope. Augmented Reality (AR) offers an innovative solution by providing immersive,

interactive, and realistic training simulations. This paper explores the development of an AR-based training system for maritime SAR teams, enabling real-time simulation of emergency scenarios such as man-overboard incidents, ship fires, and extreme weather conditions. The system integrates real-world data, AI-driven guidance, and collaborative training features to enhance decision-making, teamwork, and operational efficiency. By utilizing AR headsets and mobile devices, SAR personnel can interact with dynamic virtual elements overlaid on their environment, improving situational awareness and response times. The proposed solution reduces training costs, minimizes risks, and ensures continuous skill development. This research highlights the potential of AR technology to revolutionize SAR training, ultimately increasing survival rates in maritime emergencies.

48. Dynamic Analysis of the Romanian Maritime Workforce

Autor: stud. Georgian-Teodor POTERAȘU, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA

Abstract: The maritime industry plays a crucial role in Romania’s economy, with a constantly evolving workforce influenced by global trends, technological advancements, and regulatory changes. This study examines the dynamics of Romanian maritime personnel, focusing on employment trends, skill development, and adaptation to international standards. Using statistical data and qualitative analysis, the research highlights workforce fluctuations, the impact of automation, and the challenges faced by seafarers in an increasingly digitalized environment. Additionally, it explores the role of maritime education institutions in shaping future professionals and the effects of labor migration on the national industry. The findings provide insights into workforce sustainability, training

needs, and policy recommendations to enhance competitiveness. By understanding the shifting dynamics of maritime personnel, stakeholders can develop strategies to ensure a resilient and well-trained workforce, capable of meeting the demands of the global shipping industry. This analysis contributes to a broader perspective on Romania's position in the international maritime sector.

49. General Overview of Navigation Assistance Systems

Autor: stud. Mihai RAȘCU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: Maritime navigation has significantly evolved with the integration of advanced assistance systems designed to enhance safety and efficiency at sea. This subchapter provides a comprehensive overview of navigation assistance systems, focusing on their role in preventing collisions and optimizing vessel operations. Key technologies such as radar, Automatic Identification System (AIS), Electronic Chart Display and Information System (ECDIS), and Global Positioning System (GPS) are examined. The discussion highlights how these systems work individually and in an integrated manner to support decision-making on board. Additionally, the impact of regulatory frameworks, including IMO standards and COLREGs, is analyzed to understand how these systems align with international maritime safety requirements. The challenges associated with these technologies, such as human-machine interaction, data accuracy, and cybersecurity risks, are also considered. This section aims to provide a foundation for understanding how navigation assistance systems contribute to safe and efficient maritime transport.

50. Maritime Transport in the Context of Political-Military Crises

Autor: stud. Tudorel – Petru REBENCIUC, Academia Navală „Mircea cel Bătrân", Constanța
Îndrumător: Conf. univ. Dr. Romeo BOȘNEAGU

Abstract: Maritime transport plays a vital role in global trade and economic stability, but it is highly vulnerable to political and military crises. This thesis examines the impact of such crises on maritime logistics, analyzing disruptions in supply chains, security challenges, and economic consequences. The study explores historical case studies and contemporary conflicts to assess how geopolitical tensions, armed conflicts, and sanctions affect maritime routes and port operations. Additionally, it evaluates strategies adopted by shipping companies and international organizations to mitigate risks, including rerouting, security measures, and policy adaptations. The research highlights the need for resilience in maritime transport, emphasizing the importance of international cooperation and adaptive strategies. By identifying key vulnerabilities and proposing potential solutions, this dissertation aims to contribute to a better understanding of how maritime transport can navigate the challenges posed by political and military crises, ensuring continuity in global trade.

51. Maneuvering of the Tanker for Berthing and Operating at the Terminal

Autori: stud. Alexandru SCARLAT, stud Cristian VERDES, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: This project analyzes the maneuvering of tanker ships in challenging weather conditions for Ship-to-Ship (STS) transfer operations, focusing on the associated risks and applicable technological solutions. The study explores the technical characteristics of oil tankers, the equipment used in

STS transfers, and the safety measures implemented for environmental protection. Through the analysis of a specific case the transfer conducted in the Gulf of Oman the paper highlights operational challenges and the importance of complying with international regulations. The conclusions emphasize the necessity of using modern technologies, effective coordination, and continuous crew training to optimize the safety and efficiency of maritime transfers.

52. Maneuvering of the "Tarantul" Type Ship for Crossing the Sulina-Brăila Canal

Autor: stud. Constantin Alexandru SIMION, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: Navigating the Sulina-Brăila route with the NPR 190, a Tarantul-class warship, presents multiple challenges that require careful maneuvering and operational awareness. This study explores the key navigational difficulties encountered along this route, including the impact of adverse weather conditions, the squat effect in shallow waters, and the suction effect when passing close to riverbanks or larger vessels. The paper also examines the hydrodynamic interactions specific to the Danube's variable depths and currents, which can significantly influence the ship's handling and stability. By analyzing these factors, the study provides insights into effective navigation strategies and operational measures to enhance safety and efficiency while transiting this inland waterway.

53. Study on the Way That Currents, Waves and Tides Influence the Efficiency of Port Operations

Autor: stud. Alin-Gabriel SINTION, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Andra NEDELCU

Abstract: This thesis investigates how natural oceanic forces currents, waves, and tides impact the efficiency of port operations. Through a combination of theoretical analysis and empirical data, the study explores the relationship between these forces and key operational factors such as vessel docking times, cargo handling, and overall port throughput. By analyzing case studies from various global ports, the research identifies patterns in how these marine conditions affect scheduling, safety, and productivity. The study also evaluates potential mitigation strategies, including technological innovations, infrastructure adjustments, and operational adaptations to enhance efficiency under varying marine conditions. The findings provide valuable insights for port authorities, shipping companies, and logistics managers, offering recommendations to optimize operations and reduce disruptions caused by environmental factors and contributing to the development of more resilient and efficient port systems in the face of dynamic and changing maritime conditions.

54. Analysis of the Effects of Marine Pollution on Climate Change

Autor: stud. Dumitru Cristian STOIAN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Andra NEDELCU

Abstract: Marine pollution and climate change are two of the most pressing global challenges facing the environment today. These two phenomena are interdependent and mutually reinforcing, disrupting the balance of marine ecosystems and having a significant impact on the global climate. While marine pollution continues to escalate, climate change is driving shifts in weather patterns and altering ecosystem structures, making the analysis of their interaction crucial for developing effective environmental protection policies.

55. Methods and Procedures of Search and Rescue with Aero and Naval Means.

Autori: stud. Alin-Costi STOICA, stud. George-Cosmin NANU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Lect. univ. Dr. ing. Dumitru CORDUNEANU

Abstract: Search and rescue (SAR) operations utilizing aerial and naval assets involve coordinated efforts to locate, assist, and recover individuals in distress over land and sea. Aerial means, such as helicopters and fixed-wing aircraft, provide rapid response, wide-area surveillance, and precise deployment of rescue personnel or equipment. Naval units, including ships and specialized vessels, support extended operations, serve as recovery platforms, and ensure sustained assistance in maritime emergencies. SAR missions employ advanced technologies like radar, infrared sensors, and GPS for efficient target localization. Standardized protocols, such as the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual, guide coordination among agencies. Effective SAR operations require integration of communication systems, real-time data sharing, and strategic deployment of resources. Combining aerial speed with naval endurance enhances mission success, reducing response time and increasing survival rates in critical situations.

56. Transit of the Bosporus and Dardanelles Straits

Autor: stud. Elena-Cristina TAIFAS, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: The project analyzes the transit of the Bosphorus and Dardanelle's Straits, highlighting the physical and geographical characteristics, maritime currents, wind conditions, and navigation rules. It describes the heavy maritime traffic in the area, the traffic separation schemes, control and surveillance stations, as well as the list of lighthouses and fog signals. Additionally, it presents the rules and reporting system required

for vessels transiting the straits, along with the importance of pilotage and the specific procedures for pilot embarkation and disembarkation. The conclusions emphasize the necessity of adhering to navigation rules, maintaining heightened awareness of traffic, and avoiding dangerous maneuvers for a safe passage.

57. Manoeuvring the Vessel in Special Conditions - Manoeuvring the Cruise Ship for Crossing the Corinth Channel

Autor: stud. Florin-Theodor TĂNASE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: This project analyzes the maneuvering of a cruise ship under special conditions, focusing on crossing the Corinth Canal. The theoretical study highlights the strategic importance of the canal and the specific navigation challenges in this narrow waterway with strong currents. The case study examines the characteristics of the ship and the ports involved, as well as the voyage stages. Special attention is given to critical maneuvers, including departure from the port, entry into the destination port, and crossing the canal under unexpected weather conditions, such as a sudden storm. The conclusions provide recommendations for navigation in similar conditions, emphasizing the importance of preparation and safety measures. This project contributes to understanding operational challenges and optimizing maneuvering strategies for passenger ships navigating difficult maritime routes.

58. VLCC Type Ship Maneuver for Operation at Offshore Terminals

Autor: stud. Mihnea-Teodor TROFIN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: This paper analyzes the maneuvering of Very Large Crude Carriers (VLCC) at offshore terminals, particularly at Floating Production, Storage, and Offloading (FPSO) units. Offshore terminals are strategic points for hydrocarbon transfer, and operating these vessels requires adapting strategies based on metocean conditions and specific infrastructure. The study details the types of mooring systems used for FPSOs, the equipment involved in crude oil transfer, and the main phases of the maneuver: approach, docking, cargo transfer, and departure. Critical factors such as crew safety, continuous monitoring of environmental conditions, and the use of advanced technologies to reduce risks are highlighted. The paper emphasizes the complexity of VLCC operations in this environment and the necessity of efficient coordination between the crew, terminal, and control systems. Adhering to procedures and using appropriate equipment are essential for the success of these operations.

59. Challenges and Solutions of Inland Waterway Navigation: The Case of the Danube

Autor: stud. Andrei TUFĂ, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: Inland waterway navigation plays a crucial role in transportation and trade, offering an environmentally friendly and cost-effective alternative to other modes of transport. However, navigating the Danube River presents several challenges, including fluctuating water levels, sedimentation, infrastructure deficiencies, and regulatory complexities. These obstacles impact the efficiency, safety, and economic viability of transport along the river.
This project analyzes the main challenges faced in Danube navigation and explores viable solutions, such as modernizing infrastructure, improving hydrological monitoring, harmonizing

regulations, and implementing digital technologies for traffic management. By addressing these issues, inland navigation can be optimized, contributing to sustainable economic development and enhanced regional connectivity. The study aims to provide a comprehensive understanding of the Danube's navigational difficulties and propose strategic measures to improve its functionality. The findings may serve as a valuable resource for policymakers, stakeholders, and industry professionals seeking to enhance the efficiency of inland waterway transport.

60. Special Maneuvers with Sailing Boats from Palazu Mare Used for The Training of Students

Autor: stud. Anamaria ȚURCANU**,** Academia Navală „Mircea cel Bătrân", Constanța
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: Sailing navigation is an essential training method for students looking to develop seamanship skills and sailing expertise. This project explores the use of sailboats as an educational tool, giving students hands-on experience in maneuvering, wind dynamics, sailing technique.
Through theoretical lessons and practical exercises, students will learn to adjust sails according to wind conditions and perform essential maneuvers. The project emphasizes teamwork, problems solving and environmental responsibility, learning the maneuvers, signals and rules of sailing, preparing future naval officers with a solid foundation in sustainable sailing. By integrating sailing into student training, this initiative enhances hands-on learning, encourages leadership and reinforces real-life decision-making skills, strengthens teamwork and lays the foundations of essential information for future careers.

61. Harbor Tug Operations for Chemical Tanker Ships
Autor: stud. Răzvan-Ionuț VASLUIANU, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN
Abstract: Port tug operations play a critical role in ensuring the safe maneuvering of chemical tanker ships in confined harbor spaces. Given their size, structural complexity, and the hazardous nature of their cargo, these vessels require specialized tug assistance for docking, berthing, and navigating through port channels. This study explores the unique characteristics of chemical tankers, including their segmented cargo tanks, corrosion-resistant materials, and stability challenges. Various tug types and towing techniques are analyzed, emphasizing the importance of coordination between ship crews and tug operators. A case study on a simulated port maneuver in Rotterdam highlights real-world applications of towing strategies under specific environmental conditions. The findings underscore the necessity of meticulous planning, crew training, and advanced towing technologies to enhance operational efficiency and safety. Recommendations focus on improving port infrastructure and implementing simulation-based training for better preparedness in complex towing scenarios.

62. Maneuverability of a Tanker Ship in Extreme Hydro-Meteorological Conditions
Autori: stud. Elena-Teodora BANIȚĂ, stud. Alex-George MIHAIL, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN
Abstract: The maneuverability of a tanker ship in diverse hydro-meteorological conditions is crucial for maritime safety and efficiency. This project examines key nautical qualities alongside dynamic characteristics such as speed, inertia, and course stability. It highlights the specific structural and

operational attributes of tankers designed for transporting liquid cargoes like crude oil and chemicals. A major focus is on challenges posed by extreme weather, including strong winds, high waves, and ocean currents. The study analyzes wind impact on maneuverability, trajectory disruption, and stability issues. It also explores the role of hydrometeorological forecasting in navigation safety and essential preparatory measures for storms. Additionally, the project presents strategies for safe navigation in rough seas, emphasizing ballast adjustment and course selection to minimize risks. These insights enhance understanding of tanker operations and improve maritime safety in challenging conditions.

63. Ship Docking Study

Autor: stud. Claudiu Ionuț BUCSA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: The project **"Ship Docking Study"** focuses on how to perform the docking of a ship and analyzes the factors that can influence the safety of lifting the ship to the dock and the repair activities performed during the docking. It also includes a discussion of docking methods for ships and technical aspects of the process that affect load variation according to a selected docking surface method.

64. Particular Manoeuvres Performed with the Maritime Rescue and Diving Support Ship "Grozavul"

Autori: stud. Mălina-Andreea BUZAMĂT, stud. Narcis-Cristian NEAGOE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: The paper entitled "Particular Maneuvers performed with the Maritime Rescue and Diving Support Ship "Grozavul" aims to study the case of special maneuvers performed by

"NMSIS Grozavul" of the Romanian Naval Forces, based on a theoretical study and using graphical representations. The paper will cover the following maneuvers: man, overboard maneuver, ship maneuvering in icy areas and ship and the ship's preparation for the activities with divers.

65. The Contribution of Automation Technologies to the Efficiency of Maritime Ports

Autor: stud. Alexandru CONSTANTIN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: Maritime ports play a crucial role in global trade, and automation technologies significantly enhance their efficiency. The integration of autonomous cranes, robotic vehicles, and smart tracking systems optimizes cargo handling, reducing operational delays and increasing throughput. Automated cranes enable faster loading and unloading of containers, minimizing human errors and improving safety. Moreover, artificial intelligence and IoT-based tracking systems enhance logistics by providing real-time data on container locations, reducing waiting times and streamlining supply chains. Automated guided vehicles (AGVs) transport cargo with precision, decreasing fuel consumption and lowering operational costs. The implementation of automation in ports leads to improved productivity, reduced environmental impact, and enhanced security. Ports like Rotterdam and Singapore serve as examples of successful automation adoption, demonstrating increased capacity and operational efficiency. Although initial investments are high, the long-term benefits make automation essential for the future of maritime logistics.

66. Methods to Reduce Stress and Fatigue Crew on Board Seagoing Vessels

Autor: stud. Cosmin DECIU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: Sailing the seas and oceans poses constant challenges for naval crews, particularly in terms of stress and fatigue management. This paper explores various effective methods and strategies for reducing these problems, given the extreme working environment and operational pressures involved. Psychological techniques and practical interventions such as stress management training programs, ergonomic cubicle design, effective time management policies and optimized work routines are examined. By evaluating these solutions, the paper proposes practical recommendations for improving the well-being and performance of maritime crews in heavy seafaring conditions.

67. The Study on the Evaluation of Modern Monitoring and Control Systems for Maritime Traffic in Congested Costal Areas

Autor: stud. Andrei Ionut DIMIAN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: The study evaluates modern maritime traffic monitoring and control systems in congested coastal areas, considering the high risks of collisions and pollution. By analyzing technologies such as AIS, radar, satellites, and artificial intelligence, the study explores solutions for optimizing traffic flow, preventing accidents, and protecting the environment. The specific challenges of these areas, such as difficult weather conditions and limited infrastructure, are examined, with a focus on efficient data integration from various sources. The study emphasizes the importance of

cooperation between maritime authorities and international organizations to ensure the safety and sustainability of maritime traffic.

68. Maneuvering of the Training Ship ”Mircea” for the Transit of Constanța-Brăila

Autor: stud. Asp. ing Ionuț-Daniel RĂDULICEA, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: This project provides an in-depth analysis of the maneuvering of the training ship "Mircea" on the Constanța - Brăila route, a region that presents specific challenges for both maritime and inland navigation. The study explores essential aspects of the transit, including hydrodynamic considerations such as channel depth, squat effect, suction, and bank effect, all of which influence the ship's behavior in confined waters. Critical points along the route are identified, and solutions are proposed to ensure safe navigation in difficult conditions. The case study examines the operational procedures required for an efficient transit, such as pilot embarkation, proper use of navigation charts and instruments, and measures to prevent collisions and blockages. Additionally, strategies for optimizing speed and maneuverability based on hydro-meteorological conditions are presented. The conclusions emphasize the necessity of rigorous preparation, strategic planning, and precise execution of maneuvers key aspects for the training of future naval officers. This study contributes to the development of inland navigation skills, making it highly relevant for improving both safety and efficiency in maritime-river transit.

69. Docking Vessel Maneuver and Cargo Transfer to SBM

Autor: stud. Vlad-Theodor STOICA, Academia Navală „Mircea cel Bătrân”, Constanţa

Îndrumător: Ș.L. univ. Dr. ing. Sergiu ȘERBAN

Abstract: The project analyzes the maneuvering of the VLCC Amore Mio in an SBM (Single Buoy Mooring) system.
The stages of preparation and berthing of the ship are detailed, as well as the measures necessary for safe operation in variable weather conditions. The paper identifies associated risks, such as oil spills or collisions, and proposes preventive measures, such as constant monitoring and crew training.

70. The Study on the Implications for the Marine Environment of Treating Ballast Water Containing Microplastics in Suspension Using UV-Based Systems Aboard Ships.

Autor: stud. Florin Mădălin CLOȘCA, Academia Navală „Mircea cel Bătrân", Constanța
Îndrumător: Conf. univ. Dr. ing**.** Dinu -Vasile ATODIRESEI

Abstract: This study investigates the environmental implications of treating ballast water containing microplastics in suspension using ultraviolet (UV) treatment systems aboard ships. Ballast water is a significant pathway for the introduction of microplastics into marine ecosystems, where they can cause harm to marine organisms and disrupt ecological balances. UV treatment systems, commonly employed to disinfect ballast water, have been explored for their potential to reduce the concentration of microplastics. This research assesses the efficiency of UV technology in degrading or removing microplastics from ballast water, as well as the potential environmental impacts of treated water released into the marine environment. Additionally, the study examines the effectiveness of UV-based systems in different environmental conditions and the possible long-term effects on marine life. The findings aim to contribute to sustainable maritime practices and help mitigate the adverse effects of microplastic pollution in marine ecosystems.

SISTEME ELECTROMECANICE NAVALE

BIROUL SECŢIUNII
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Membri: Ș.L. univ. Dr. ing. Octavian Narcis VOLINTIRU
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Lector univ. Dr. Adriana SPORIȘ
Sala E121

1. Multifunctional Cargo Ship. Bilge-Ballast System. Specifications and Automation.

Autor: stud. Marius Cristian ISAIA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Beazit ALI
Abstract: The ballast-bilge system plays a crucial role in maintaining the safety, optimal operating conditions of the ship and compliance with environmental policy. The main function of the ballast system is to manage the stability, trim and maneuverability of the ship by adding or discharging ballast water from the ballast tanks which helps to adjust the center of gravity of the ship, thereby preventing excessive roll and overturning of the ship, as well as reducing or increasing draft of the ship to access different waterways. The main function of the bilge system is to remove water or liquids that accumulate as a result of ship operations that can be find in the lower compartments of the ship (bilge wells) to prevent excessive accumulation of water or liquids and to maintain stability and safety ships.

2. Optimizing the Operation of the Propulsion Plant on a Passenger Ship. Analysis of Ship Propulsion Efficiency

Autor: stud. Robert-Cristian RACUCI, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Ș.L. univ. Dr. ing. Octavian – Narcis VOLINTIRU

Abstract: This dissertation explores the optimization of the propulsion system on a passenger ship, with a focus on analyzing its efficiency. The study is structured into four main chapters, covering the current state of propulsion technologies, a case study of a symmetrical ferry, resistance calculations, and a comparative analysis of propulsion system performance.

The first chapter reviews conventional and alternative propulsion technologies, discussing fuel types, environmental considerations, and technological advancements in marine propulsion. The second chapter presents the characteristics of the ship and its propulsion system, detailing structural aspects and performance data. The third chapter focuses on resistance calculation methodologies, with an emphasis on forward resistance and the COGAS propulsion system. The fourth chapter compares different propulsion systems, analyzing the efficiency of COGAS versus diesel-electric systems. By assessing various propulsion technologies, this study provides insights into optimizing energy efficiency and reducing emissions in passenger ships. The findings contribute to the ongoing discourse on sustainable maritime transportation and offer valuable considerations for future ship designs.

3. Multifunctional Cargo. Sizing of the Hydraulic Installation for Maneuvering Hatch Covers.

Autor: stud. Robert Marian SFETCU, Academia Navală „Mircea cel Bătrân”, Constanţa

Îndrumător: Prof. univ. Dr. ing. Beazit ALI

Abstract: Sizing of the hydraulic installation for maneuvering hatch covers. The document analyses the technical characteristics and operating systems of a 15,000 TDW cargo ship, intended for the transport of general cargo, bulk, timber and containers. The ship has a length of 145.91 meters, a draft

of 8.9 meters and a speed of 15.8 knots. Propulsion is provided by a Sulzer reversible two-stroke diesel engine of 9,400 HP, with direct transmission to a fixed-pitch propeller. An important component of the document is the analysis of the hydraulic system used to operate the hatch covers. This system is composed of linear hydraulic motors, radial piston pumps, hydraulic filters, valves and distributors, which ensure oil flow control. Linear hydraulic motors are used to operate the hatch covers, side gates and loading ramps, providing rigidity and a quick response to commands. Hydraulic pumps, especially radial piston ones, are responsible for providing the necessary flow rate, and filters ensure the removal of impurities for efficient operation.

4. Study on the Efficiency of Equipping Ships with Unconventional Energy Sources

Autor: stud. Ioan ȚUȚUIANU, Academia Navală „Mircea cel Bătrân”, Constanța

Îndrumător: Ș.L. univ. Dr. ing. Ionel POPA

Abstract: Maritime transport, responsible for 90% of global trade, is essential for economic growth but heavily reliant on fossil fuels, contributing 2.5% of global CO_2 emissions and exacerbating climate change. To address this, international initiatives, such as the IMO's GHG strategy, aim to cut CO_2 emissions by 40% by 2030 and 70% by 2050. This study examines renewable energy solutions for reducing the maritime carbon footprint. Solar energy, via photovoltaic panels, and wind energy, through technologies like rigid sails and Flettner rotors, are increasingly used to power ships, while hydrogen fuel cells offer a promising zero-emission alternative.

5. Passenger Ship. Flow Modeling in A Static Mixer of an Exhaust Gas Cleaning System

Autor: stud. Andrei Sebastian FLOREA, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Conf. univ. Dr. ing. Marian RISTEA-KOMORNICKI

Abstract: Cruise ships rely on big diesel engines that produce significant amounts of exhaust gases, including sulphur oxides (SO_x), nitrogen oxides (NO_x), and particulate matter, which contribute to air pollution. To reduce emission, operating costs and comply with international regulations, exhaust gas cleaning systems, also known as scrubbers, are used. These systems work by spraying seawater or a special alkaline solution into the exhaust stream, effectively neutralizing harmful pollutants before they are released into the atmosphere. There are three main types of scrubbers: open-loop, closed-loop, and hybrid systems. In the beginning, this paper explores the working principles, individual components, monitored parameters and international regulation of open loop exhaust gas cleaning systems. Later on, focuses on the flow modeling within a static mixer using computational fluid dynamics, as the objective is to optimize mixing efficiency and pH buffering.

6. A Comparative Study Regarding the Equipment of Container Ships with Dual Fuel Type Engines

Autor: stud. Răzvan-Ștefan FRUNZĂ, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Ș.L. univ. Dr. ing. Ionel POPA

Abstract: This study investigates the technical and economic feasibility of equipping container ships with dual-fuel engines capable of running on both conventional fuel and liquefied natural gas (LNG), using the container ship Emma Mærsk as a case study. The study analyzes the performance and environmental impact of the ship's current Wärtsilä-Sulzer

14RT-flex96c engine, and compares it to the technical and economic characteristics of dual-fuel engines, considering IMO requirements and current trends in decarbonizing maritime transport. The technical challenges of installing and operating dual-fuel engines on container ships, such as adapting the onboard space and implementing LNG storage systems, are also analyzed. Finally, conclusions and recommendations are made regarding the viability of dual-fuel engines as a solution to reduce the carbon footprint of maritime transport, and the future prospects of this technology are examined.

7. The Influence of Cruise Ships Exhaust Gases on the Environment

Autor: stud. Marian-Iulian MATEI, Academia Navală „Mircea cel Bătrân", Constanța

Îndrumător: Conf. univ. Dr. ing. Marian RISTEA-KOMORNICKI

Abstract: The cruise industry is a vital segment of the global maritime sector, playing a significant role in tourism, trade, and economic development. Cruise ships, often described as floating cities, contribute immensely to the local or global economy, offering employment opportunities, fostering international tourism, and supporting related industries such as hospitality, entertainment, and retail. However, while the cruise industry is thriving, it has raised concerns over environmental impacts, including pollution and marine degradation. This presentation explores the significance of cruise ships in the maritime industry, their environmental implications, and measures to mitigate pollution in line with MARPOL annexes.

8. Modeling of the Main Engine Cooling System Using Software Programs

Autor: stud. Cornel Nicolae MUNTEANU, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Ș.L. univ. Dr. ing. Daniel MĂRĂȘESCU

Abstract: This paper focuses on modeling the cooling system of the main engine using specialized software. The cooling system plays a crucial role in maintaining the optimal operating temperature of marine engines, preventing overheating and ensuring efficiency. By utilizing modern simulation tools, the study aims to analyze the thermal behavior of the system, identify potential inefficiencies, and propose optimization solutions. The research involves developing a virtual model of the cooling circuit, integrating key components such as heat exchangers, pumps, and thermostats. The software-based approach allows for detailed simulations of temperature distribution, flow dynamics, and energy consumption. Through various simulations, different operating conditions are tested to evaluate system performance under different loads. The results provide valuable insights for improving the design and operational efficiency of cooling systems in marine engines. By leveraging advanced computational tools, this study contributes to the optimization of electromechanical naval systems, enhancing reliability and sustainability in maritime applications.

Keywords: cooling system, main engine, modeling, software simulation, marine engineering.

9. Oil Tanker Ship: Design and Sizing of the Anchoring and Mooring System. Hydraulic Operation of Anchor Winches.

Autor: stud. Silviu Sebastian ȘIMONESCU, Academia Navală „Mircea cel Bătrân”, Constanţa

Îndrumător: Prof. univ. Dr. ing. Beazit ALI

Abstract: Maritime transport is one of the most important modes of global transportation, and oil tanker ships play a crucial role in transferring petroleum products over long distances. Given the vast volume of cargo transported and the specific characteristics of these loads, oil tankers require

sophisticated technical equipment and precise operating systems to ensure safe and efficient transportation. Among the most critical components of such vessels are the anchoring and mooring systems, which provide stability in ports or during loading and unloading operations. These systems are essential for preventing accidents and protecting the environment, considering the risks associated with handling petroleum products. The size and performance of anchoring systems are critical to the safety of the vessel and crew. Their operation is often carried out through complex hydraulic systems that enable precise and efficient anchor handling, even under extreme weather conditions or challenging seabed environments. Additionally, the proper dimensioning of the anchoring system is a complex technical process that must consider multiple variables, such as the ship's weight, weather conditions, and specific port operations. This dissertation will analyze the process of designing and sizing the anchoring system of an oil tanker, with a particular focus on the hydraulic operation of anchor winches. We will explore both theoretical principles and practical applications, demonstrating the importance of proper design and equipment selection to ensure both the safety and efficiency of anchoring operations. Additionally, the study will include a case study to illustrate the dimensioning process of an anchoring system on a real vessel and to evaluate the performance of such a system under specific operational conditions.

10. Optimal Analysis of the Marine Propulsion System
Autor: stud. Marius-Vlăduț TATAOANA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Octavian-Narcis VOLINTIRU
Abstract: This topic examines modern propulsion solutions for ships through a comparative analysis of the **MAN B&W ME-GI** and **WinGD X-DF** engines, both based on dual-fuel

technology. The study focuses on energy efficiency, safety, compliance with **EEXI** regulations, and the structural characteristics of each system. The **MAN B&W ME-GI** engine employs an advanced high-pressure injection system and double-walled piping for enhanced safety, ensuring optimal fuel consumption control. In contrast, **WinGD X-DF** integrates Common Rail technology and the Delta injection system, providing efficient combustion and reduced emissions. The comparative analysis indicates that the **MAN B&W ME-GI** engine is the optimal solution for onboard installation due to its superior compliance with energy efficiency standards and reliability in operation.

11. Optimization of the Operation of the Propulsion System on a Ferryboat. Analysis of the Ship's Propulsion Efficiency

Autor: stud. Marian GROSU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Octavian-Narcis VOLINTIRU

Abstract: In the context of globalization and the constant increase in maritime transport requirements, ferryboats play a crucial role in ensuring mobility and connectivity between various regions. They are widely used for the transport of passengers, vehicles and goods, representing a critical element in the maritime transport infrastructure. Given the importance of these vessels, optimizing propulsion systems becomes a priority to ensure operational efficiency, reduce costs and minimize environmental impact. The main objective of this work is to evaluate the performance and efficiency of such a combined propulsion system through a theoretical and practical approach. In this regard, the work will include the calculations necessary for the sizing and optimization of the system, the detailed description of the components and technologies used, as well as the analysis of the results obtained from simulations and performance tests.

12. Optimization of the Propulsion System Operation on an LNG Vessel. Analysis of the Ship's Propulsion Efficiency – Project Overview.

Autor: stud. Eduard-Nicolae ILIE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Octavian-Narcis VOLINTIRU

Abstract: The increasing demand for sustainable and energy-efficient maritime transport has led to the continuous improvement of propulsion systems for LNG vessels. This paper will analyze the current state of LNG ship propulsion technologies and will present firstly a case study of a selected vessel. A key aspect of this study is the proposal of an optimized propulsion system, based on a resistance calculation and efficiency assessment. The paper compares the existing propulsion system with the proposed alternative, using a SWOT analysis to evaluate advantages and disadvantages. Additionally, a comparative Energy Efficiency Existing Ship Index (EEXI) calculation is performed to assess the environmental and operational impact. The results provide a comprehensive understanding of the most effective propulsion configuration, contributing to the optimization of LNG vessel efficiency and sustainability.

13. AFRAMAX TANKER ship. Modeling the Propulsion System Using Software Programs

Autor: stud. Alexandru MARIN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Daniel MĂRĂȘESCU

Abstract: The following essay will deal with the Aframax Tanker Vessel Class. This class includes exclusively tankers with a deadweight (DWT) between 80.000 – 120.000 metric tones. The main objective of the essay is modeling of propulsion system using software programs. The ship chosen for this essay is MT"PACIFIC GALAXY", double hull

Aframax Tanker. The vessel has a cargo tank capacity of 127.000 m3, 110.000 DWT, 42 meter beam, with main engine MITSUI-MAN B&W Diesel Engine 7S60MC x 1 set / 14.280 KW x 105 rpm

14. Powertrain Modelling for a Triple-E Class Container Vessel, with Focus on the Propeller and Propeller Shaft Using Ansys Software Program

Autor: stud. Ștefan PETRO, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Daniel MĂRĂȘESCU

Abstract: The proposed study explores powertrain modelling for a Triple E Class container vessel, focusing on propeller and propeller shaft using Ansys software program.

In first chapter of the study are highlighted main dimensions and characteristics of Maersk Milan. Chapter two summarizes the Ansys software, modification of the propeller to comply with the dimensions referred in chapter one, and a brief presentation of the propeller shaft. In chapter three, through the Ansys Fluid Flow (Fluent) the hydrodynamic simulations were performed, also was carried out structural analysis of the propeller. The results provided a deeper understanding of propulsion generation, pressure distribution and cavitation effects, helping to optimize the efficiency and reliability of propeller. Chapter four highlights the analysis of the propeller shaft. Simulations have assessed the structural integrity of the shaft under multiple loads, identifying weak points and determining the shaft life and fatigue level.

OPERAREA ŞI CONDUCEREA SISTEMELOR ELECTROENERGETICE NAVALE

BIROUL SECŢIUNII
Preşedinte: Prof. univ. Dr. ing. Vasile DOBREF
Membri: Ș.L. univ. Dr. ing. Leon PANĂ
Ș.L. univ. Dr. ing. Iancu CIOCIOI
Sala LI356

1. Renewable Energy in the Maritime Sector

Autor: stud. Emre-Dragoș BOGDAN, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Conf. univ. Dr. ing. Florențiu DELIU

Abstract: The integration of renewable energy sources in maritime transportation is crucial for achieving sustainability. Solar and wind power are particularly significant in reducing the industry's reliance on fossil fuels. Solar energy, harnessed through photovoltaic panels, provides a sustainable source of electricity for onboard systems, minimizing the dependence on diesel generators and lowering greenhouse gas emissions. Wind energy, captured through advanced sail designs and wind turbines, can be utilized for vessel propulsion and electricity generation, leading to considerable reductions in operational costs and environmental impact. The adoption of these technologies not only promotes environmental sustainability but also enhances energy security by decreasing dependency on volatile fuel markets. By incorporating renewable energy solutions, the maritime sector can achieve greater efficiency, reduced operational costs, and a smaller carbon footprint, thereby contributing to a more sustainable and environmentally friendly future.

2. Considerations Regarding the Use of Automation Systems in the Operation of Cargo Hold Hatches on a Cargo Ship

Autor: stud. Cristian BUHUM, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Paul BURLACU

Abstract: This dissertation explores the use of automation systems in cargo hold hatch operations on cargo ships. It examines how automation, including hydraulic and electric actuators, control systems, and real-time monitoring, can optimize cargo handling by reducing operational time, minimizing human error, and improving reliability. The study discusses the integration of these systems into modern vessels, addressing challenges like compatibility with existing ship structures, installation costs, and resistance to change from crew members. It also emphasizes the importance of crew training in operating and maintaining automated systems. Emerging trends such as Artificial Intelligence (AI), Internet of Things (IoT), and predictive maintenance are highlighted for their potential to revolutionize ship operations. Furthermore, the dissertation examines the environmental and regulatory impacts of automation, focusing on fuel efficiency and compliance with maritime regulations. Overall, the research outlines the transformative benefits and challenges of automation in cargo ship operations, offering insights for the future of the industry.

3. Temperature Monitoring System with MOBUS RTU Communication Between Siemens PLC and Sensors

Autor: stud. Andrei-Darius DELIU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Iancu CIOCIOI

Abstract: This paper presents the design and implementation of a temperature monitoring system utilizing MODBUS RTU

communication for data exchange between Siemens PLCs and temperature sensors. The system is aimed at providing real-time temperature measurements, enabling efficient monitoring and control in industrial automation settings. The Siemens PLC serves as the central controller, communicating with multiple temperature sensors over a serial network using the MODBUS RTU protocol. The paper details the system architecture, the configuration of the PLC, the setup of sensor communication, and the software implementation for data acquisition and monitoring. A focus is placed on the accuracy, reliability, and scalability of the system, along with its integration into existing automation environments. The system's performance is evaluated through a series of tests, demonstrating its capability to provide stable, low-latency temperature monitoring and effective system diagnostics. The paper concludes with a discussion on the potential applications and future enhancements of the proposed system.

4. Technical Solutions for Implementing Digital Protections in the Ballast System

Autori: stud. Teodora DURA, stud. Valentin ȚENE, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Leon PANĂ

Abstract: This dissertation explores technical solutions for implementing digital protections in the ballast system, focusing on replacing traditional relays with Schneider Electric's EOCR digital relays. The ballast system plays a crucial role in maintaining a vessel’s stability by controlling water transfer in ballast tanks. However, conventional protection systems often lack precision, monitoring capabilities, and integration with modern automation networks. The study highlights the advantages of digital protections, including real-time monitoring, improved fault detection (such as phase loss, overloads, and unbalanced phases), and seamless integration

with SCADA systems via Modbus RS485. By implementing digital relays, the ballast system benefits from increased reliability, reduced maintenance costs, and optimized operational efficiency. Through an in-depth analysis of the EOCR digital protection devices, this research demonstrates how upgrading protection systems enhances maritime safety and ensures compliance with industry standards. The proposed solution contributes to the automation and modernization of ballast system operations, providing long-term benefits for maritime transport.

5. Procedures and Alarm Systems in Case of Fire

Autor: stud. Mihnea-Gabriel GROSU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Iancu CIOCIOI

Abstract: The paper "Procedures and Fire Alarm Systems" addresses the importance of implementing effective procedures and appropriate alarm systems in the event of a fire to ensure the protection of life and property. It analyzes various types of alarm systems, including electronic and manual ones, and their role in the rapid detection of fire. The paper also discusses intervention protocols, which include evacuating individuals, initial actions of security personnel, and collaboration with firefighting services. It highlights the need for ongoing employee training to respond promptly and correctly in such situations. International and national regulations in the field, as well as safety standards that must be followed in construction and equipment, are presented. The conclusion emphasizes the importance of integrating advanced technologies and clear procedures to reduce risks and minimize the impact of a fire.

6. Study of the Operation of Asynchronous Motor Drive Systems with PWM Control on Board Ships.

Autor: stud. Oana NIȚESCU, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Prof. univ. Dr. ing. Vasile DOBREF

Abstract: Drive systems play a key role in the operation of modern ships, ensuring the efficient conversion of energy into mechanical motion required for propulsion, operation of auxiliary equipment and other critical systems on board. These systems must meet strict requirements for energy efficiency, reliability and performance, given the demanding environment in which ships operate. In a naval context, drive systems are exposed to extreme conditions, such as fluctuating temperatures, high humidity and intense mechanical stresses.

Energy efficiency is a major concern in the naval industry, given the high cost of fuel and the impact on the environment. Optimized drive systems can significantly contribute to reducing fuel consumption by using advanced technologies, such as asynchronous motors with PWM (Pulse Width Modulation) control. They allow precise control of the speed and torque of electric motors, contributing to the optimization of energy consumption. These systems also allow the reduction of energy losses by dynamically adjusting operating parameters according to the actual load.

7. Integrated Management System for Electric Motors in Atex Environments

Autori: stud. Valentin ȚENE, stud. Teodora DURA, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Ș.L. univ. Dr. ing. Leon PANĂ

Abstract: ATEX (Atmosphères Explosibles) environments require strict safety standards to prevent explosions caused by electrical equipment. This dissertation examines the **integrated management system for electric motors** in such hazardous

areas, focusing on **zone classification, certified equipment categories, and essential safety functions** to eliminate ignition sources.
The study explores **temperature, vibration, gas, and pressure monitoring**, emphasizing their integration into **the UMC100.3 controller** for efficient motor management. Protection methods, including **flameproof enclosures, pressurization, and temperature control**, are analyzed to enhance safety and reliability. Additionally, the impact of **frequency converters on motor performance** in ATEX environments is assessed.
Finally, the dissertation highlights **the importance of certification and regulatory compliance**, demonstrating how an integrated management system improves the **safe and efficient operation** of electric motors in explosive atmospheres.

8. Considerations for Using an Energy Management System on Board A Passenger Ship

Autor: stud. Andrei-Iulian TOMA, Academia Navală „Mircea cel Bătrân", Constanța
Îndrumător: Conf. univ. Dr. ing. Paul BURLACU
Abstract: The implementation of an Energy Management System (EMS) on passenger ships is crucial for optimizing energy consumption, reducing fuel costs, and minimizing environmental impact. This paper examines key considerations, including system integration with onboard power sources, real-time energy optimization, and regulatory compliance. It also explores operational constraints, passenger comfort implications, and the role of data analytics in improving efficiency. Technological advancements and case studies are analyzed to highlight best practices and challenges in EMS deployment. The findings provide valuable insights into enhancing sustainability and efficiency in maritime operations.

9. Protection of Electric Motors from Abb

Autori: stud. Armand Cristian C.C TRIFU, stud. Ionuț Sorin C. NEDELCU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Leon PANĂ

Abstract: Protection of Electric Motors from ABB
Electric motors are essential in various industries, and protecting them ensures efficiency and longevity. ABB provides advanced solutions to safeguard motors from electrical and mechanical faults. ABB's motor protection includes overload protection, preventing excessive heating, and short-circuit protection, which quickly disconnects power during faults. Phase failure and imbalance protection ensure stable operation, while temperature monitoring prevents overheating. ABB also offers undervoltage and overvoltage protection to maintain optimal performance and earth fault protection to prevent hazards. With smart protection solutions, ABB integrates IoT-enabled monitoring and predictive maintenance, enhancing reliability and energy efficiency. By using ABB's motor protection devices, industries can reduce downtime, minimize maintenance costs, and extend motor lifespan.

10. Considerations Regarding the Use of PLCs in the Drive of Three-Phase Asynchronous Motors Used in Naval Electric Drives

Autor: stud. Sorina-Mihaela ANTOCHE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Paul BURLACU

Abstract: This research paper examines the integration of Programmable Logic Controllers (PLCs) with three-phase asynchronous motors, focusing on their significance in modernizing electric propulsion systems in the maritime industry. The study delves into the technical, operational, and economic aspects of utilizing PLCs for controlling and managing these robust and efficient motors, which are well-

suited for the rigorous demands of marine applications. By harnessing the capabilities of PLCs, the project demonstrates enhanced control over critical motor parameters, resulting in improved operational efficiency, reduced energy expenditures, real-time monitoring, and elevated safety standards through decreased reliance on manual interventions. The paper also addresses the challenges of implementing PLC systems in harsh maritime environments, including resistance to vibrations, temperature fluctuations, and humidity, as well as compliance with industry regulations and the necessity for advanced programming. Through a comprehensive analysis of architecture, programming, and implementation strategies, this research highlights the technological advancements that facilitate the deployment of PLC-driven asynchronous motor control systems, showcasing their potential to significantly enhance the reliability, efficiency, and sustainability of electric propulsion in the maritime sector.

11. Study on Interference Rejection in Radar Equipment
Autor: stud. Alexandru Ion DINU, Academia Navală „Mircea cel Bătrân", Constanța
Îndrumător: Ș.L. univ. Dr. ing. Iancu CIOCIOI
Abstract: This paper provides a comprehensive overview of the fundamental principles governing radar systems and their operations. The study examines the core concepts of radar technology, beginning with the basic principle of electromagnetic wave propagation and reflection. It explores how radar systems transmit radio waves and analyze their reflections to determine crucial target parameters, including range, velocity, and direction.
The research delves into key components such as transmitters, receivers, and antenna systems, explaining their roles in the radar operation chain. Special attention is given to signal processing techniques, including pulse compression and

Doppler processing, which enhance radar performance and target detection capabilities. The paper also addresses essential phenomena affecting radar operation, such as clutter, noise, and atmospheric effects. Understanding these principles is crucial for modern applications ranging from military surveillance to weather forecasting and civilian air traffic control. This foundational knowledge serves as a cornerstone for advancing radar technology and developing more sophisticated detection systems.

12. Considerations Regarding the Use of Plc in Anchor Winch Actuation

Autori: stud. Robert MUNTEANU, stud. Cristian BUHUM, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Paul BURLACU

Abstract: This project analyzes the use of programmable logic controllers (PLCs) in the automation and control of anchor winches, highlighting their advantages in terms of efficiency, safety, and operational precision. It presents the operating principles of an anchor winch, the essential system components, and how a PLC can be used to manage the anchor lifting and lowering processes. Additionally, aspects related to sensor integration, the use of frequency inverters for motor speed control, and the implementation of protective measures against overloads or exceeding travel limits are discussed. The study includes a comparative analysis between traditional and automated control, emphasizing the benefits of a PLC-based system, such as reducing human errors, optimizing energy consumption, and enabling remote control. The project's conclusions highlight the role of PLCs in enhancing the reliability and performance of anchor winch actuation systems, contributing to the improvement of modern maritime operations.

13. Use of BIG DATA and MACHINE LEARNING Algorithms for Failure Prediction and Maintenance Program Optimization

Autori: stud. Denis NIKOLIC, stud. Petrică SUHOV, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Florențiu DELIU

Abstract: The rapid advancement of technology has led to the generation of vast amounts of data, commonly referred to as Big Data, which can be leveraged to enhance maintenance strategies in industrial and technological environments. This paper explores the application of Big Data analytics and Machine Learning algorithms for predicting equipment failures and optimizing maintenance schedules. By utilizing predictive models and real-time data analysis, organizations can improve operational efficiency, reduce downtime, and minimize maintenance costs. The study highlights various machine learning techniques, such as supervised and unsupervised learning, that contribute to failure forecasting and decision-making in maintenance management. The findings demonstrate how data-driven approaches can significantly enhance reliability and sustainability in industrial operations.

14. Analysis of High-Voltage Induction Motor Protection

Autor: stud. Cătălin Marian ȘERBAN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Leon PANĂ

Abstract: High-voltage induction motors play a critical role in industrial applications, requiring robust protection systems to ensure operational safety and reliability. This paper analyzes various protection methods designed to prevent electrical and mechanical failures, including thermal overload, short circuits, phase imbalance, and insulation breakdown. Advanced protection strategies, such as differential protection, thermal modeling, and condition monitoring, are explored to enhance

motor performance and longevity. Additionally, the study examines the implementation of modern digital relays and smart monitoring systems that provide real-time diagnostics and predictive maintenance. By integrating these technologies, industries can minimize downtime, reduce maintenance costs, and improve overall efficiency. The findings highlight the importance of a comprehensive protection strategy tailored to the specific operational environment of high-voltage induction motors, ensuring safe and efficient performance in demanding applications.

15. Automation and Control Systems for Autonomous Ships: Challenges, Benefits, and Future Perspectives

Autor: stud. Ioan-Marian ȘERBAN, Academia Navală „Mircea cel Bătrân", Constanța
Îndrumător: Lect. univ. Dr. Paul VASILIU

Abstract: In the context of rapid technological advancements, automation and control systems for autonomous ships represent an innovative direction in the maritime industry. These technologies enable operation without human intervention by leveraging artificial intelligence, advanced sensors, wireless communication, and real-time data analysis. This paper examines the major benefits of autonomous ships, including reduced operational costs, improved safety, and environmental protection through optimized fuel consumption. Additionally, it addresses the challenges associated with implementing these systems, such as cybersecurity threats, maritime regulations, and public acceptance. The integration of artificial intelligence and machine learning into autonomous navigation enhances route optimization, collision avoidance, and predictive maintenance. Furthermore, swarm technology enables collaboration between autonomous vessels, increasing efficiency in research, rescue, and maritime security operations. Autonomous navigation is also supported by advanced systems

such as radar, sonar, LIDAR, GPS, and electronic charts, ensuring precise and adaptive vessel operation. This paper also explores the future of these systems, highlighting emerging trends in maritime automation, regulatory standardization, and the adoption of sustainable solutions. The conclusions emphasize the significant impact of autonomous ships on the maritime industry, underscoring the need for well-defined strategies to integrate and optimize these technologies within a safe and efficient global ecosystem.

16. Study on the Electromagnetic Field Level in the Command Cabin of a Maritime Vessel

Autori: stud. Ștefan-Gabriel AOROȘOAIEI, stud. Andrei-Darius DELIU, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Iancu CIOCIOI

Abstract: This study analyzes the electromagnetic field levels in the command cabin of a maritime vessel. The research is structured into four chapters. The first chapter explores the characteristics of the electromagnetic environment aboard naval forces' ships, highlighting international regulations and military vessel specifications. The second chapter presents theoretical fundamentals, including electromagnetic field interactions with command-and-control equipment, sources of electromagnetic fields on military ships, and their effects on both equipment and personnel. The third chapter serves as a case study, detailing the vessel's systems, measurement and simulation methodology, and the modeling process using **ANSYS Electronics**. The obtained results are analyzed and compared with international standards. The final chapter presents conclusions based on the study's findings, offering insights into potential risks and recommendations for improving electromagnetic compatibility in naval environments.

17. Modeling and Simulation of Hybrid Systems to Optimize Performance and Energy Efficiency

Autor: stud. Ioana-Cezara VLAD, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Conf. univ. Dr. ing. Florențiu DELIU

Abstract: This presentation explores the modeling and simulation of hybrid naval propulsion systems to optimize performance and energy efficiency. In the face of the global energy crisis and the transition to renewable sources, the maritime industry faces a major challenge: reducing carbon emissions and optimizing energy consumption. The study examines the integration of solar and wind energy into naval propulsion, assessing their advantages and limitations. Using Simulink software, mathematical models of hybrid systems are simulated and tested. A case study highlights the economic and environmental benefits of these solutions, emphasizing Romania's potential to become a regional leader in renewable energy for the maritime sector. Additionally, the dissertation analyzes the impact of European regulations and international policies on the adoption of sustainable technologies in maritime transport. The results confirm the feasibility of wind-photovoltaic hybrid systems in the naval industry, providing a theoretical and practical framework for future development in this field.

18. Analysis of the Ratio Between Energy Production and Consumption on Maritime Vessels

Autor: stud. Alexandru-Georgian COSTIN, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Prof. univ. Dr. ing. Gheorghe SAMOILESCU

Abstract: This study analyzes the balance between energy production and consumption on maritime vessels, focusing on efficiency and optimization. The first chapter introduces naval electrical systems, discussing energy sources such as diesel

generators, gas turbines, hybrid, and alternative energy systems. The second chapter explores theoretical aspects of energy production and consumption, detailing major consumers like electric motors, navigation systems, and safety equipment. The third chapter presents a case study on a specific vessel, examining its energy production systems, major consumers, and overall energy balance. Based on the findings, recommendations are made to optimize energy efficiency and improve sustainability and operational performance. The study highlights the importance of energy management in maritime operations, offering insights into reducing consumption, improving system integration, and enhancing fuel efficiency for modern vessels.

19. Considerations Regarding the Use of Plc in the Actuation of Three-Phase Asynchronous Motors Used in Naval Electric Drives

Autori: stud. Sorina-Mihaela ANTOCHE, stud. Gabriela SARGHIE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Paul BURLACU

Abstract: This research paper examines the integration of Programmable Logic Controllers (PLCs) with three-phase asynchronous motors, focusing on their significance in modernizing electric propulsion systems in the maritime industry. The study delves into the technical, operational, and economic aspects of utilizing PLCs for controlling and managing these robust and efficient motors, which are well-suited for the rigorous demands of marine applications. By harnessing the capabilities of PLCs, the project demonstrates enhanced control over critical motor parameters, resulting in improved operational efficiency, reduced energy expenditures, real-time monitoring, and elevated safety standards through decreased reliance on manual interventions. The paper also addresses the challenges of implementing PLC systems in harsh

maritime environments, including resistance to vibrations, temperature fluctuations, and humidity, as well as compliance with industry regulations and the necessity for advanced programming. Through a comprehensive analysis of architecture, programming, and implementation strategies, this research highlights the technological advancements that facilitate the deployment of PLC-driven asynchronous motor control systems, showcasing their potential to significantly enhance the reliability, efficiency, and sustainability of electric propulsion in the maritime sector.

20. Sisteme BESS

Autor: stud. Florin BURDUSANU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Vasile DOBREF

Abstract: In the industrial sector, BESS offers efficient solutions for optimizing energy consumption and reducing associated costs. Peak shaving and load shifting strategies allow industrial users to reduce peak power demand and take advantage of energy price differences between peak and off-peak periods. BESS can also ensure power continuity (functioning as a UPS), protecting sensitive equipment and preventing production losses caused by interruptions. The integration of renewable energy sources, such as solar panels and wind turbines, is facilitated by BESS, which manages production intermittency and maximizes self-consumption.

21. Sustainability Considerations in the Marine Industry. Analysis of the Link Between Energy Consumption and the Carbon Footprint of Ships

Autori: stud. Valentin-Ionuț DAN, stud. Costin-Alin GHEȚU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Gheorghe SAMOILESCU

Abstract: The marine industry plays an important role in global

trade, yet it remains a significant contributor to greenhouse gas emissions due to its high energy consumption. This paper explores the intricate relationship between energy use and the carbon footprint of ships, highlighting key sustainability challenges and potential mitigation strategies. Through an analysis of fuel efficiency, alternative propulsion technologies, and regulatory frameworks, the study assesses how the industry can transition towards more sustainable operations. The paper also evaluates the impact of emerging innovations such as LNG, hydrogen fuel cells, and wind-assisted propulsion in reducing emissions. Findings indicate that optimizing energy efficiency and adopting cleaner energy sources are essential to achieving long-term sustainability in the sector. By integrating technological advancements with policy measures, the marine industry can significantly reduce its environmental impact while maintaining operational efficiency.

22. Temperature Monitoring System with MOBUS RTU Communication Between Siemens PLC and Sensors

Autor: stud. Andrei-Darius DELIU, Academia Navală „Mircea cel Bătrân", Constanța
Îndrumător: Ș.L. univ. Dr. ing. Iancu CIOCIOI

Abstract: This paper presents the design and implementation of a temperature monitoring system utilizing MODBUS RTU communication for data exchange between Siemens PLCs and temperature sensors. The system is aimed at providing real-time temperature measurements, enabling efficient monitoring and control in industrial automation settings. The Siemens PLC serves as the central controller, communicating with multiple temperature sensors over a serial network using the MODBUS RTU protocol. The paper details the system architecture, the configuration of the PLC, the setup of sensor communication, and the software implementation for data acquisition and monitoring. A focus is placed on the accuracy, reliability, and

scalability of the system, along with its integration into existing automation environments. The system's performance is evaluated through a series of tests, demonstrating its capability to provide stable, low-latency temperature monitoring and effective system diagnostics. The paper concludes with a discussion on the potential applications and future enhancements of the proposed system.

23. Study on Testing of Maritime Electronic Equipment in Terms of Electromagnetic Compatibility

Autori: stud. Cătălin Mihai DOROȘ, stud Andrei-Silviu POPESCU, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Iancu CIOCIOI

Abstract: In an era where electronic technology plays a crucial role in the safety and efficiency of maritime navigation, the electromagnetic compatibility (EMC) of equipment becomes a key factor. Electronic systems used on board ships must operate without generating electromagnetic interference that could affect other essential devices, such as radars, communication systems, and navigation equipment. This dissertation aims to analyze the testing methods for maritime electronic equipment from the perspective of electromagnetic compatibility, highlighting the applicable international standards and the specific challenges of the naval environment. The study will cover both the theoretical aspects of the electromagnetic phenomenon and the practical testing methods used to ensure equipment compliance. Through this research, the importance of EMC in the maritime field will be emphasized, along with identifying the most effective solutions for minimizing the risks associated with electromagnetic interference on board ships.

24. Innovations and Optimization Strategies for the Operation of Naval Power Systems for Efficiency, Safety, and Sustainability

Autor: stud. Daniel-Nicolae DRĂGAN, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Prof. univ. Dr. ing. Vasile DOBREF

Abstract: The paper presents a presentation of modelling of the naval power system with advantages and disadvantages, taking into account new hypotheses, based on the current modelling techniques that are channelled in two different directions, namely: the use of numerical techniques with different algorithms for transient and dynamic processes and the use of hybrid simulation techniques (analog-numerical). An analysis is made of the requirements of the electrical networks, the conditions that need to be met to optimize their operation. It analyses the electricity distribution system and proposes the introduction of two models for saving electricity.

25. Design and Development of the Application for the Control of a Naval Boiler Using PLC

Autor: stud. Florin DUMITRASCU, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Ș.L. univ. Dr. ing. Iancu CIOCIOI

Abstract: Designing and developing an application to control a marine boiler using PLC (Programmable Logic Controller) is an essential step in optimizing the operation of industrial equipment on ships. The main goal of the project is to create an automated system to regulate and monitor boiler operating parameters such as temperature, pressure and water level. By using a PLC, precise and efficient process control is ensured, reducing the risks of failures and improving the safety of operations. The application will also allow real-time visualization of relevant data and rapid intervention in case of anomalies. Ultimately, the project will contribute to increasing

the efficiency and reliability of the steam supply system on ships, having a positive impact on operational costs and equipment durability.

26. Considerations on Electric Efficiency in Maritime Vessels

Autori: stud. Emilia-Daniela NĂSTASE, stud. Oana NIȚESCU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Gheorghe SAMOILESCU

Abstract: The project titled "Considerations on Electric Efficiency in Maritime Vessels" focuses on analyzing and improving the energy efficiency of maritime vessels, with an emphasis on hybrid propulsion systems and energy management solutions. The project explores various methods and technologies aimed at optimizing energy consumption and reducing environmental impact in the maritime industry. It examines the integration of hybrid systems and renewable energy sources on board vessels, using the Color Hybrid as a case study to evaluate energy consumption and efficiency.

27. Study of the Operation of Asynchronous Motor Drive Systems with PWM Control on Board Ships.

Autori: stud. Oana NIȚESCU, stud. Emilia-Daniela NĂSTASE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. Dr. ing. Vasile DOBREF

Abstract: Drive systems play a key role in the operation of modern ships, ensuring the efficient conversion of energy into mechanical motion required for propulsion, operation of auxiliary equipment and other critical systems on board. These systems must meet strict requirements for energy efficiency, reliability and performance, given the demanding environment in which ships operate. In a naval context, drive systems are exposed to extreme conditions, such as fluctuating temperatures, high humidity and intense mechanical stresses.

Energy efficiency is a major concern in the naval industry, given the high cost of fuel and the impact on the environment. Optimized drive systems can significantly contribute to reducing fuel consumption by using advanced technologies, such as asynchronous motors with PWM (Pulse Width Modulation) control. They allow precise control of the speed and torque of electric motors, contributing to the optimization of energy consumption. These systems also allow the reduction of energy losses by dynamically adjusting operating parameters according to the actual load.

28. Considerations Regarding the Integration of Electrical and Electronic Equipment on a Ship's Navigation Bridge. The IBS (Integrated Bridge System)

Autor: stud. Petru DRĂGAN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Gheorghe SAMOILESCU

Abstract: This study examines the integration of electrical and electronic equipment on a ship's navigation bridge, focusing on the Integrated Bridge System (IBS). The first chapter provides an overview of modern navigation systems, highlighting the evolution from traditional to automated navigation, the role of electrical and electronic equipment, and international regulations. The second chapter explores the IBS architecture, its components, functionalities, and benefits, emphasizing data integration, process automation, and operational efficiency. Additionally, it discusses technological challenges, interoperability issues, and proposed improvements for future IBS development. The third chapter presents a case study on the implementation of IBS on a specific vessel, analyzing its integrated equipment, system performance, and operational advantages. The study concludes with recommendations for optimizing IBS integration, ensuring enhanced safety,

efficiency, and compliance with international maritime standards.

29. Modeling and Simulation of the Thermal Operating Regime of Electrical Contacts by Numerical Methods
Autori: stud. Răzvan-Marian PIELE, stud. Vlad-Alexandru PIELE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Florențiu DELIU
Abstract: This chapter explores the dependence between the potential and temperature of electrical contacts using numerical methods with the COMSOL application. A 3D virtual model of an electrical contact was designed in SOLIDWORKS and imported into COMSOL to analyze the thermal behavior of the contacts under different conditions. The study examines the effects of Joule heating and contact pressure, which influence the electrical and thermal conductivity of the contact surfaces. The simulations reveal that the heating of the contact path significantly affects the material properties, potentially leading to degradation or failure in extreme cases. The results, presented through graphical representations, demonstrate the correlation between the contact voltage drop and temperature increase, providing valuable insights into optimizing electrical contact design. The combined use of SOLIDWORKS and COMSOL enhances simulation accuracy and visualization, leading to a more comprehensive understanding of thermal phenomena in electrical contacts.

30. Simulation and Vibration Analysis for Fault Detection in Induction Motors Using MATLAB & Simulink
Autori: stud. Vlad-Alexandru PIELE, stud. Răzvan-Marian PIELE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Florențiu DELIU
Abstract: Fault detection in induction motors is essential for ensuring reliability and minimizing downtime in industrial

applications. This study focuses on simulating and analyzing rotor faults using vibration and electrical signal analysis in MATLAB & Simulink. The methodology is based on Broken Rotor Fault Detection in AC Induction Motors, where multiple operating conditions are considered, including healthy and faulty states with varying numbers of broken rotor bars. The simulation model extracts key features such as **current** signature analysis (MCSA) and vibration frequency response, utilizing FFT and envelope analysis to identify fault signatures. The results demonstrate a clear correlation between the number of broken rotor bars and spectral deviations in both electrical and mechanical parameters. This research highlights the effectiveness of combining electrical and vibration signal monitoring for early fault detection, supporting the implementation of predictive maintenance strategies in real-world applications.

31. Forecasting Elements and Fundamental Aspects of Renewable Energy Implementation

Autori: stud. Karina PÎSLARIU, stud. Andreea STOICA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Florențiu DELIU

Abstract: The growing need for sustainable energy solutions has led to an increased focus on renewable energy sources and their efficient implementation. This project explores key forecasting elements and fundamental aspects related to the deployment of renewable energy sources. The study analyzes various forecasting methods for renewable energy production, considering factors such as weather variability, technological advancements, and market dynamics. Additionally, the project examines essential aspects of integrating renewable energy into existing energy systems, addressing challenges related to storage, grid stability, and policy frameworks. The findings

highlight best practices for optimizing the use of renewable resources, ensuring a sustainable and resilient energy transition.

32. Technical Study of Power Quality in Finite Power Naval Electric Power Systems on Electrically Propelled Ships
Autori: stud. Andrei-Silviu POPESCU, stud. Cătălin Mihai DOROȘ, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Vasile DOBREF
Abstract: The quality of electrical energy in finite power naval power systems plays a crucial role in ensuring the reliable and efficient operation of electrically propelled ships. This paper presents a comprehensive technical study on power quality issues in shipboard electrical systems, focusing on the challenges posed by limited power generation capacity and complex load dynamics. The study examines key power quality parameters, such as voltage stability, harmonic distortion, flicker, unbalance, and transient disturbances, which can significantly impact the performance of onboard electrical equipment. The research explores the sources of power quality disturbances, including nonlinear loads, rapid load variations, and switching operations, as well as their effects on the efficiency and lifespan of electrical components.

33. Management System for the Production and Distribution of Electricity on Board OPV Patrol Vessels
Autor: stud. Ștefan Nicolae ROȘU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Vasile DOBREF
Abstract: This paper presents a control system for the production and distribution of electricity on board offshore patrol vessels (OPVs). The system is designed to meet the specific requirements of OPVs, which must be able to operate independently for extended periods in harsh environments. The

system includes a number of features to ensure reliability and efficiency, including:
A modular design that allows for easy expansion and maintenance.
A distributed architecture that provides redundancy and fault tolerance.
An advanced control system that optimizes the use of available power resources.
A user-friendly interface that provides operators with real-time information on the status of the system.
The paper also includes a case study of an OPV equipped with the proposed control system. The results of the case study demonstrate the effectiveness of the system in meeting the operational requirements of OPVs.

34. The Study of Dynamic Positioning Systems for Maritime Vessels. Applications in Offshore Engineering.

Autori: stud. Gabriela SÂRGHIE, stud. Sorina-Mihaela ANTOCHE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Vasile DOBREF

Abstract: Dynamic Positioning (DP) systems play a crucial role in maintaining the position and stability of maritime vessels without the need for anchors or mooring. These systems rely on advanced sensors, thrusters, and computer-controlled algorithms to counteract external forces such as wind, waves, and currents. This study explores the principles, components, and operational strategies of DP systems, emphasizing their significance in offshore engineering applications. Key areas of focus include the classification of DP systems, their redundancy levels, and safety considerations. The research also highlights real-world applications in oil and gas exploration, subsea construction, and renewable energy projects. Furthermore, technological advancements, such as AI-driven predictive controls and enhanced automation, are examined for their

potential to improve DP efficiency and reliability. By analyzing case studies and industry trends, this study provides valuable insights into the evolution and future developments of DP technology, contributing to safer and more efficient offshore operations.

35. Analysis of the Ecological Impact of Wind Energy
Autori: stud. Andreea STOICA, stud. Karina PÎSLARIU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Florențiu DELIU
Abstract: This project examines the ecological impact of wind energy, focusing on both its benefits and drawbacks. Wind energy helps reduce greenhouse gas emissions, air pollution, and water usage, playing a key role in combating climate change. However, it can also lead to habitat disruption, wildlife fatalities, and noise pollution. The life cycle of wind turbines, including raw material extraction and disposal, also poses sustainability challenges. The study highlights the need for careful management to maximize wind energy's environmental benefits while minimizing its ecological impacts.

36. Protection and Control Systems for Naval Electrical Networks
Autor: stud. Petrică SUHOV, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Florențiu DELIU
Abstract: This research explores the design and implementation of protection and control systems for naval power grids. Naval electrical networks face unique challenges due to their specific operating environment, such as limited space, high reliability requirements, and vulnerability to external disturbances. The paper investigates various protection strategies, including fault detection, isolation, and system restoration, tailored to meet the dynamic demands of naval vessels. Furthermore, the research

delves into control systems that enhance the stability, efficiency, and safety of these grids, ensuring seamless integration with onboard power generation and distribution systems. A comprehensive analysis of both traditional and advanced protection techniques is provided, alongside the integration of real-time monitoring tools for predictive maintenance. The findings offer valuable insights into optimizing the resilience and performance of naval power grids in the face of evolving technological and operational challenges.

37. Analysis of the Efficiency of Electric Energy on Maritime Vessels, Taking into Account the Electrical Sources, the Distribution, and the Energy Consumption of Onboard Electro-Energy Consumers

Autori: stud. Roxana-Mădălina TÎRÎLĂ, stud. Emilia-Daniela NĂSTASE, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Gheorghe SAMOILESCU

Abstract: The efficiency of electric energy on maritime vessels is crucial for optimizing operational costs, ensuring sustainability, and meeting regulatory standards. This study analyzes the performance of electrical energy systems on ships by examining energy sources, distribution networks, and the consumption of onboard electro-energy consumers. A comprehensive assessment of different power generation methods, including conventional diesel generators and alternative energy sources, is conducted to determine their efficiency and environmental impact. The study also explores the effectiveness of energy distribution systems in minimizing losses and ensuring stable power supply. Additionally, the consumption patterns of various onboard electrical consumers, such as propulsion systems, auxiliary machinery, and hotel loads, are evaluated to identify potential energy-saving strategies. The findings provide insights into improving energy

management practices, enhancing efficiency, and reducing fuel consumption. Implementing optimized energy solutions can contribute to lower operational costs and a more sustainable maritime industry.

38. Study of Protection Against Electric Arc

Autor: stud. Cristian-Andrei ZAHARIA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Leon PANĂ

Abstract: Electric arc is one of the most dangerous phenomena in electrical systems. It occurs when a high potential difference creates a conductive path through the air, often due to insulation failures, surface contamination, or operational errors. The arc generates extreme temperatures (over 20,000°C), capable of melting metals, causing equipment damage, fires, and serious injuries. The shockwave and radiation pose additional risks to personnel. Preventive measures include using well-insulated modern equipment, personal protective gear (flame-resistant clothing, visors, gloves), and regular maintenance. Proper training is crucial for identifying risks, using protective equipment, and following safety protocols. A combination of advanced technology, strict maintenance, and employee education ensures a safe work environment. Compliance with international and local safety standards is essential for protecting both personnel and infrastructure while maintaining operational continuity.

39. Analysis of Naval Propulsion Systems Using Encapsulated Thrusters on a Vessel

Autori: stud. Costin-Alin GHEȚU, stud. Valentin-Ionuț DAN, Academia Navală „Mircea cel Bătrân", Constanța
Îndrumător: Prof. univ. Dr. ing. Gheorghe SAMOILESCU

Abstract: Naval propulsion technology continues to evolve, seeking improvements in efficiency, maneuverability, and

sustainability. This paper examines the application of encapsulated thrusters as an alternative propulsion system for vessels, analyzing their performance, advantages, and limitations. Encapsulated thrusters, known for their compact design and enhanced hydrodynamic efficiency, offer potential benefits such as reduced cavitation, improved thrust control, and lower maintenance requirements. Through a comparative analysis with conventional propulsion systems, this study assesses the impact of encapsulated thrusters on fuel consumption, vessel stability, and operational flexibility. Additionally, the paper explores their potential role in reducing environmental impact by enhancing energy efficiency and integrating with hybrid or electric propulsion systems. Findings suggest that encapsulated thrusters could be a viable solution for modern naval applications, contributing to the advancement of more efficient and sustainable maritime propulsion technologies.

40. Optimizing Energy Efficiency in Naval Electric Power Systems Through Harmonic Analysis and Signal Filtering.

Autor: stud. Andrei TIMOFTE, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Conf. univ. Dr. ing. Paul BURLACU

Abstract: Naval power systems have received significant attention in recent years. The issues and considerations associated with power systems are often misunderstood. With the growth and expansion of power electronics and the proliferation of nonlinear loads in power system applications, harmonics and their effects on power quality have become a topic of concern. Although the problems generated by harmonics in power systems are small, their analysis **can contribute to increasing the reliability of the facility's power system**. Harmonics become problematic when their magnitude produces a resonance in the power system. Today, power systems contain a large number of nonlinear elements that generate waves at different frequencies.

INGINERIE ŞI MANAGEMENT

BIROUL SECŢIUNII
Preşedinte: Prof. univ. Dr. ing. Florin NICOLAE
Membri: Conf. univ. Dr. ing. Alexandru COTORCEA
Conf. univ. Dr. Gheorghe GRECU
Conf. univ. Dr. ing. Rita AVRAM
Sala L120

1. Analysis of the Development Strategy of Green Logistics Chains in Ports

Autor: stud. Lorena-Elena AVRAM, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Elena-Rita AVRAM

Abstract: The development of green logistics chains in ports is a key aspect of sustainable transport strategies. This paper analyzes the implementation of green logistics solutions in ports, with a focus on the Port of Constanta. It examines current trends in sustainable logistics, European and international policies, and best practices from comparable ports such as Koper, Piraeus, and Varna. The study conducts a SWOT analysis of the Port of Constanta, identifying strengths (strategic location, existing infrastructure), weaknesses (high costs, regulatory gaps), opportunities (green investments, international collaborations), and threats (economic crises, geopolitical risks). The research highlights strategies for reducing carbon emissions, optimizing processes, and integrating green technologies. Finally, the paper provides recommendations for port authorities and policymakers to enhance sustainability and suggests future research directions in green port logistics.

2. Eco-Labeling of Freight Transport Services

Autor: stud. Daniel BERBECI, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Florin NICOLAE

Abstract: The idea of eco-labeling is to provide customers with an easy-to-understand signal regarding the ecological impact of using a productor service. With this paper, we propose an eco-labeling system for freight transportation. We discuss design options based on a common emission reporting standard and a related communication protocol. We further explain a procedure for deriving labels for shipments of goods and provide examples illustrating and evaluating the labeling process at selected land-based freight transport services. Results indicate that eco-labels can grade the environmental impact of a transport service reliably, even if heterogeneous goods are moved together. Finally, we outline challenges for future research associated with eco-labeling in freight transportation markets.

3. Safety Analysis of Transportation Chain for Dangerous

Autor: stud. Carmen-Maria BORTAS, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA

Abstract: A safety analysis of the transportation chain for dangerous goods involves identifying risks at each stage (loading, transit, unloading), ensuring compliance with relevant regulations (ADR, IMDG, ICAO), and implementing safety measures such as proper packaging, secure transport vehicles, and emergency response plans. It includes monitoring transport conditions, using tracking systems, training personnel, and conducting drills. Continuous assessment and learning from past incidents help improve safety protocols to prevent accidents, spills, or other hazards.

4. Opportunities for Implementing the Use of Alternative Fuels in Port Operations

Autor: stud. Mihaela BOZAGIU, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA

Abstract: The implementation of alternative fuels in port operations represents a significant step towards reducing environmental impact and increasing sustainability in maritime activities. Ports are major hubs of emissions due to high energy consumption, ship operations, and heavy-duty equipment. Transitioning to alternative fuels such as LNG, hydrogen, biofuels, and electrification can significantly lower greenhouse gas emissions, improve air quality, and comply with international environmental regulations like IMO 2020. Key opportunities include integrating renewable energy sources, retrofitting existing equipment, and encouraging collaboration between port authorities, shipping companies, and technology providers. Challenges such as infrastructure development, high initial investment, and regulatory alignment must be addressed. However, successful implementation can lead to long-term cost savings, enhanced efficiency, and positioning ports as leaders in green innovation. The transition also aligns with global sustainability goals, fostering economic growth and environmental stewardship in the maritime sector.

5. Management of Logistics and Cargo Survey Operations in Ports

Autor: stud. Maria BURIU, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Conf. univ. Dr. ing. Filip NISTOR

Abstract: This paper addresses the key aspects of logistics operations management and cargo inspection in ports, with a particular focus on the Port of Constanta. The work is structured into three main chapters, each detailing the

processes, standards, and specific challenges in the field. The processes of cargo and vessel inspection are described, with an emphasis on the importance of maintaining the quality of transported goods and the verification procedures that ensure safety and compliance with international regulations.

6. Maritime Security in the Transport Business

Autor: stud. Roberta-Ioana CĂLIN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Filip NISTOR

Abstract: Maritime transport is a key pillar of international trade, accounting for over 90% of total trade volume. By enabling the efficient movement of goods over long distances, it supports the integration of emerging economies and reduces logistical costs. In a globalized world, maritime networks sustain trade flows and contribute to economic, social, and technological progress. Beyond its commercial role, maritime transport requires investments in infrastructure, sustainability, and innovation to remain relevant.

7. Resilience of Transport Modes Against External Challenges

Autor: stud. Andreea CÎLEA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA

Abstract: The resilience of transport modes against external challenges refers to their capacity to adapt and recover from disruptions such as geopolitical conflicts, economic fluctuations, natural disasters, environmental changes, and regulatory shifts. This resilience is vital for maintaining smooth global trade and supply chains. Key strategies include diversifying transport options, enhancing infrastructure, adopting digital technologies for improved efficiency, and fostering public-private partnerships. Additionally, developing

contingency plans, strengthening logistics networks, and continuous workforce training are essential. By focusing on these areas, transport systems can better navigate external pressures, ensuring sustainable growth and maintaining competitiveness in the face of evolving global challenges.

8. Methods for Optimizing Maritime Freight Transport
Autor: stud. Georgiana DARABA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA
Abstract: Maritime transport remains the most efficient and viable solution for international trade, in particular due to its high transport capacity and low costs per unit of cargo. The growth of global trade and the expansion of emerging economies continue to underpin the development of this sector.
The evolution of maritime transport has been driven by several factors, such as the geographical distribution of resources, comparative advantages between economies, economies of scale through the use of large ships and technological improvements of ships and ports. Technological developments have led to the emergence of specialized types of vessels such as bulk carriers, Ro-Ro vessels, container carriers, LNG carriers and offshore vessels. This diversification has helped to optimize shipping for each type of cargo. Changes in the structure of global supply chains, driven by recent crises and the need for sustainability, are leading to a trend towards regionalization of trade.

9. Courier Logistics Services – Analysis of the Technology Impact-Carbon Footprint Relationship
Autor: stud. Ionuț-Cătălin DRUGĂ, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Florin NICOLAE

Abstract: This paper examines the latest technologies used in the courier logistic sector and their influence of reducing companies' environmental footprint. The study explores technological solutions such as electric vehicles, warehouse automation, and advanced algorithms for route optimization. These innovations significantly contribute to lowering fossil fuel consumption, reducing CO2 emissions, and streamlining operational processes. The study highlights the positive impact of digitization, including the use of digital platforms for delivery management and emission monitoring, enabling companies to adopt more sustainable practices. The adoption of new technologies not only enhances logistical performance but also supports the transition to more eco-friendly business models. The paper advocates for an integrated approach for courier companies, balancing operational efficiency with ecological responsibility.

10. The Resilience of Critical Logistic Infrastructures Within the Maritime and Inland Waterway Transport System of Romania

Autor: stud. Daniel HARBUR HERBERT, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Florin NICOLAE

Abstract: Maritime and inland waterway transport are essential to Romania's economy, with critical logistics infrastructure such as Constanta Port and the Danube playing a strategic role in international trade. However, these infrastructures face major risks, including climate change, underinvestment, lack of digitalization, and geopolitical instability. This dissertation analyzes vulnerabilities and proposes measures to enhance the resilience of critical logistics infrastructure in maritime and inland waterway transport. The proposed solutions include modernizing equipment, digitalizing operations, strategic investments, and developing integrated risk management

policies. The study highlights the need for a strategic approach to leverage Romania's potential in European logistics networks and increase the competitiveness of maritime and inland transport.

11. SWOT Analysis of the Port of Constanta

Autor: stud. Sema IANOS (GEALMAMBET), Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Gheorghe SAMOILESCU
Abstract: The paper presents the four components of the SWOT analysis specific to the port of Constanța. Details and impacts are analyzed for each component. It analyzes the influence of the implementation of green technology and sustainable energy, taking into account the region, climate change and the economic and political instability of the area.

12. Challenges in Increasing Energy Efficiency for the Maritime Sector

Autor: stud. Sema IANOS (GEALMAMBET), Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Gheorghe SAMOILESCU
Abstract: The paper presents the challenges existing in the Port of Constanta for increasing energy efficiency in the maritime and port sectors. It analyzes the effects of adequate infrastructure, the effects of the costs involved in implementing port infrastructure modernization, the effects of resistance to change and the challenges arising from the integration of other types of transport in the efficiency improvement of the Port of Constanta.

13. Optimizing Rail Freight Transport

Autor: stud. Bianca-Mihaela IONAȘCU, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA
Abstract: The development of the global supply chain has amplified the role of rail transport due to its multiple advantages. These include high speed, increased safety and reliability, lower costs and favorable environmental impact compared to road transport. These benefits make rail transport an optimal solution for streamlining logistics and reducing the carbon footprint, reinforcing its importance in the modern supply chain.

14. Analysis of Actions to Ensure Safe and Sustainable Maritime Transport in Europe

Autor: stud. Gabriela MAZILU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Filip NISTOR
Abstract: This paper examines the challenges and opportunities associated with ensuring safety and sustainability in maritime freight transport, particularly in the context of technological advancements. Maritime transport, faces increasing demands to reduce greenhouse gas emissions, enhance energy efficiency, and protect marine ecosystems. The study explores advanced innovations such as smart and autonomous ships, alternative energy sources (e.g., LNG, hydrogen, solar, and wind energy), and the implementation of international frameworks like the ISM Code and MARPOL Convention. It also compares environmental performance monitoring and reporting systems, namely EU MRV and IMO DCS, highlighting their strengths and limitations. By integrating cutting-edge technologies and robust regulatory measures, the maritime sector can significantly contribute to the United Nations' 2030 Agenda for Sustainable Development, fostering a balance between economic efficiency and environmental stewardship. The paper further underscores the importance of proactive strategies to address long-term environmental impacts.

15. Project Cargo Logistics Related to the Activity of a Port Terminal

Autor: stud. Anca MIHALCEA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Florin NICOLAE

Abstract: Project cargo is represented by heavy, oversized, complex and high-value pieces of equipment related to infrastructure projects, such as wind turbines components, transformers, drilling equipment's, etc. These types of goods require specific and specialized lifting, lashing, storage and transport operations during loading/unloading in ports. The objective of this paper is to highlight the role of port handling and storage operations, meant to support the logistics of large infrastructure projects. Such projects require robust equipment's to ensure safe and secure process and large storage areas for certain amounts of time, based on site installation schedule. An important point of the study is to consider the influence of the time factor on the port area demand, in order to prevent port congestion. While analyzing a terminal in Constanta that handles wind turbines, this paper presents the importance of understanding and then implementing logistical requirements in order to ensure a successful cargo project.

16. Analysis of Energy Efficiency in Intermodal Transport

Autor: stud. Enis MURATCEA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Gheorghe SAMOILESCU

Abstract: The project theme, "Analysis of Energy Efficiency in Intermodal Transport" focuses on evaluating the energy performance and environmental impact of intermodal transport systems, which combine multiple modes of transportation (rail, road, maritime, air) to optimize the flow of goods and passengers. The main objective of the study is to identify methods and technologies that can improve energy efficiency,

reducing resource consumption and greenhouse gas emissions. Through a comparative analysis of various intermodal transport scenarios, the project aims to provide sustainable solutions for the logistics sector, contributing to the achievement of carbon footprint reduction goals and promoting a green economy. The research results will highlight the advantages and challenges associated with implementing such systems, as well as the potential for integrating renewable energy sources and smart technologies in the transportation field.

17. Analysis of Measures to Reduce Greenhouse Gas Emissions on Military Ships

Autor: stud. Ștefan NECULAI, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Florin NICOLAE

Abstract: The energy efficiency of military ships is influenced by different factors than those driving efficiency improvements in commercial shipping. While regulatory frameworks, economic considerations, and fuel price fluctuations shape commercial maritime strategies, military vessels prioritize operational effectiveness and mission readiness. This paper examines key differences between military and commercial ships, including hull armor requirements, speed demands, crew size, and procurement models, all of which impact energy consumption. The reinforced hulls and high-speed capabilities of warships result in greater resistance and fuel usage, while larger crews and extended procurement timelines further differentiate them from commercial vessels. Despite the lower emphasis on environmental concerns, global defense policies increasingly stress energy security and sustainability. Aligning governmental objectives with naval operational priorities is essential to achieving long-term energy efficiency in military fleets. This study explores viable strategies to enhance fuel conservation without compromising mission effectiveness.

18. Civil-Military Cooperation in Logistics Activities at Nato Level

Autor: stud. Emanuela PETCU, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Conf. univ. Dr. ing. Filip NISTOR

Abstract: Civil-military cooperation in logistics is essential for NATO operations, helping to share resources, improve mobility, and ensure smooth missions. This paper looks at how civilian and military logistics work together within NATO, focusing on the benefits, challenges, and best ways to cooperate. Good coordination between military forces and civilian groups such as governments, international organizations, and private companies helps make logistics more efficient. However, differences in structures, goals, and procedures can create difficulties. The paper explores strategies to improve teamwork, enhance communication, and overcome these challenges. By strengthening civil-military cooperation, NATO can increase its ability to respond quickly to crises, improve supply chains, and support military operations effectively. The study highlights key lessons and recommendations for better logistics collaboration at the NATO level.

19. Drones - Innovative Technical Solutions for the Maritime Industry

Autor: stud. Andreea-Cătălina POP, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Prof. univ. Dr. ing. Florin NICOLAE

Abstract: The maritime industry has rapidly embraced the use of drones (UAVs), supported by advanced technologies such as the internet of things, artificial intelligence and cloud computing. UAVs, unmanned aircraft controlled remotely or autonomously, integrate aviation, communications and energy technology for various maritime applications. They are used in

ship inspections, marine life monitoring, search and rescue operations and environmental assessments. Drones provide real-time data on ocean currents, water quality and weather conditions, supporting efficient decision-making, navigational safety, route optimization and reducing environmental impact.

20. Risk Analysis Associated with the Planning and Execution of Freight Transport

Autor: stud. George-Alexandru RADU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA

Abstract: This study examines the risks associated with the planning and execution of freight transport, focusing on operational, financial, and environmental challenges. The first part explores key risk factors, including logistical disruptions, regulatory compliance, and security threats. The second section analyzes risk management strategies, emphasizing route optimization, cargo security, and contingency planning. A case study is presented to assess real-world risk scenarios and evaluate mitigation measures used in freight transport. The findings highlight the importance of proactive risk assessment, technological integration, and strategic planning in reducing disruptions and improving efficiency. The study concludes with recommendations for enhancing resilience in freight transport operations, ensuring cost-effectiveness, regulatory compliance, and sustainability in the logistics sector.

21. Analysis of Innovative Technological Solutions for Improving Naval Logistics Operations

Autor: stud. Alexandru ȘANDRU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Elena-Rita AVRAM

Abstract: This paper analyzes innovative technological solutions aimed at enhancing naval logistics operations. As

maritime transport remains a cornerstone of global trade, optimizing logistics processes is essential for improving efficiency, reducing costs, and ensuring the timely delivery of goods. The study explores advanced technologies such as automation, artificial intelligence and blockchain, assessing their impact on key areas like supply chain management, cargo handling, and fleet coordination. Through a comparative analysis of current practices and emerging solutions, the paper highlights the benefits of integrating smart technologies to streamline operations, improve decision-making, and increase sustainability. Additionally, the research addresses potential challenges related to the implementation of these technologies, including cybersecurity risks, high investment costs, and the need for specialized personnel. The findings provide valuable insights for stakeholders in the naval logistics sector, offering strategic recommendations for adopting innovative solutions to achieve operational excellence.

22. Risk Assessment of Container Operation Process in Ports Considering Functional Areas

Autor: stud. Ștefana SAVA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Florin NICOLAE

Abstract: Port terminal container operations are intricate and fraught with dangers that can affect operational continuity, safety, and logistical effectiveness. The main hazards related to container handling, storage, and transportation in port logistics domains are examined in this research. The study analyzes the effects of risks on supply chain performance by classifying them into operational, environmental, security, and financial aspects. Potential mitigation techniques are examined using a risk assessment methodology, with a focus on automation, technology developments, and best practices in logistics management. The results emphasize the necessity of proactive

risk management strategies to improve port terminal operations' sustainability and resilience.

23. Warehouse Management Solutions (WMS)

Autor: stud. Maria Denisa SORICĂ, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. Andrei BĂUTU

Abstract: Modern logistics is strongly influenced by technological advancements, with Warehouse Management Systems (WMS) playing a key role. WMS are software platforms designed to optimize and automate warehouse operations, from goods reception to shipment, ensuring real-time traceability and efficiency. This paper analyzes the evolution of WMS, from simple, manual process-based solutions to complex platforms integrated with advanced technologies like IoT and artificial intelligence. It explores market options, differentiating between free and commercial solutions, and highlights their benefits, such as lower operational costs and faster order processing. The study also addresses implementation costs, including software acquisition, staff training, and IT infrastructure integration. Finally, case studies demonstrate the practical impact of adopting WMS, emphasizing reduced processing errors and higher customer satisfaction.

24. Logistic Planning in Naval Military Operations

Autor: stud. Victor-Andrei SPOIALĂ, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Filip NISTOR

Abstract: Logistic planning in naval military operations focuses on the efficient management of resources required for conducting operations at sea. This includes the supply of fuel, food, ammunition, and equipment, as well as ship maintenance and personnel support. Due to the dynamic nature of the

maritime environment, naval logistics requires detailed and flexible planning, adapted to weather conditions, long distances, and strategic risks. The main objective is to ensure the continuity and efficiency of missions, minimizing disruptions and providing the necessary support for the success of military operations.

25. The Resilience of Critical Logistic Infrastructures Within the Maritime and Inland Waterway Transport System of Romania

Autor: stud. Bogdan – Ștefan TIMOFTICIUC, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Florin NICOLAE

Abstract: Maritime and inland waterway transport are essential to Romania's economy, with critical logistics infrastructure such as Constanta Port and the Danube playing a strategic role in international trade. However, these infrastructures face major risks, including climate change, underinvestment, lack of digitalization, and geopolitical instability. This dissertation analyzes vulnerabilities and proposes measures to enhance the resilience of critical logistics infrastructure in maritime and inland waterway transport. The proposed solutions include modernizing equipment, digitalizing operations, strategic investments, and developing integrated risk management policies. The study highlights the need for a strategic approach to leverage Romania's potential in European logistics networks and increase the competitiveness of maritime and inland transport.

26. Methods for Optimizing Road Freight Transport

Autor: stud. Gabriela-Miruna TOFAN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA

Abstract: Optimizing Road freight transport involves strategies

to enhance efficiency, reduce costs, and minimize environmental impact. Key methods include route optimization, which leverages GPS and advanced software to identify the most efficient paths, reducing fuel consumption and delivery times. Load optimization ensures maximum vehicle capacity usage, minimizing empty runs and improving cost-effectiveness. Implementing advanced technologies such as telematics and real-time tracking helps monitor vehicle performance and driver behaviour, leading to better maintenance planning and fuel efficiency. Additionally, adopting eco-friendly driving practices, like smooth acceleration and speed regulation, reduces emissions and fuel usage. Fleet management systems play a crucial role in coordinating logistics, scheduling, and resource allocation. Collaboration with supply chain partners and the integration of multimodal transport options can further enhance efficiency. Overall, these methods contribute to sustainable, cost-effective, and reliable road freight transport operations.

27. Security Measures Applied to Special Maritime Transports

Autor: stud. Daniela Nicolle TUDORAN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA
Abstract: The maritime transport of ammunition and armament is a critical component of global security and defense logistics, requiring strict adherence to international regulations and safety measures. This study explores the theoretical framework governing the transportation of hazardous military goods, highlighting key international regulations such as the IMDG Code, SOLAS Convention, and ISPS Code. The research further examines security challenges, including the risks of explosion, piracy, and logistical difficulties. A case study on a Frontex Operation is analyzed, focusing on the role of a coast

guard patrol vessel in transporting armament within the mission. The study reveals that effective risk management, coordinated security measures, and compliance with international regulations are crucial to ensuring safe maritime transport. The conclusions emphasize the need for enhanced surveillance, technological advancements, and international cooperation to strengthen the security of arms transportation in maritime operations. This research provides valuable insights into the evolving landscape of maritime security and defense logistics.

28. Management and Automation of Activities in Warehouses Equipped with Automated Guided Vehicles Agvs

Autor: stud. Georgiana ANDREI, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA
Abstract: This study examines the management and automation of activities in warehouses using Automated Guided Vehicles (AGVs). The first chapter explores the evolution, role, and benefits of AGVs in modern logistics, emphasizing their impact on efficiency and operational safety. The second chapter focuses on warehouse automation, discussing AGV integration with management systems, performance monitoring, and economic impact. The third chapter presents a case study on AGV simulation, using FlexSim to analyze traffic management and workflow optimization in warehouses. The results highlight the advantages of AGVs in reducing costs, improving accuracy, and enhancing operational efficiency. The final chapter summarizes key findings and offers recommendations for optimizing AGV use in logistics, emphasizing the importance of automation and simulation tools in modern warehouse management.

29. Analysis of Strategic Alliances Between Ports

Autor: stud. Mălina-Cristina BĂLAN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Filip NISTOR

Abstract: Strategic alliances between ports have an essential role to ensure the efficiency and competitiveness of maritime transport. In a globalized trading environment, port cooperation contributes to optimizing the supply chain, reducing costs and expanding market share. The evolution of port alliances reflects the need for continuous adaptation with a direct impact on operational performance. Factors such as infrastructure, hinterland connectivity, technological integration and economic policies significantly influence port selection. Relevant examples from Europe, such as HAROPA (Le Havre-Rouen-Paris) and Antwerp-Bruges, highlight the advantages of collaboration in logistics and sustainability. At the same time, geopolitical risks, regulatory constraints and technological challenges are critical factors that can affect the success of port alliances. Analysis of the most effective cooperation strategies offers valuable insights for the development of sustainable partnerships capable of ensuring long-term resilience and growth in the maritime industry.

30. Methods for Efficient Planning of Transport

Autor: stud. Gabriela-Anca CÎRCIU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Alexandru COTORCEA

Abstract: Transportation can have significant effects on mobility, economic development, environmental quality, government finances and quality of life. Therefore, wise planning is necessary to help create high-quality transportation facilities and services at a reasonable cost with minimal environmental impact and to enhance economic activity. Failure to plan can lead to severe traffic congestion, dangerous

travel patterns, slow economic growth, negative environmental impacts, and misuse of money and resources. Transportation planning is a process that develops information to help make decisions about the future development and management of transportation systems, especially in urban areas. It involves determining the need for transportation facilities such as new highways, transit systems, freight facilities, and transportation terminals. The planning process also determines the location, capacity and management of these facilities. Transportation can have significant effects on mobility, economic development, environmental quality, government finances and quality of life. Therefore, wise planning is necessary to help create high-quality transportation facilities and services at a reasonable cost with minimal environmental impact and to enhance economic activity. Failure to plan can lead to severe traffic congestion, dangerous travel patterns, slow economic growth, negative environmental impacts, and misuse of money and resources. Transportation planning focuses primarily on developing long-range transportation plans that can be used to set priorities for implementing projects in the future. Such plans should ideally balance the need to build new roads and transit facilities (supply) with future travel demand patterns with minimal effect on the environment and within the funding capabilities of the government agencies involved.

31. Cybersecurity Risk in the Maritime Industry

Autori: stud. Andrei Leonard MORARU, stud. Claudia Alexandra TRANDAFIR, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Prof. univ. Dr. ing. Florin NICOLAE

Abstract: The dissertation explores the increasing importance of cybersecurity within the maritime industry, emphasizing the challenges posed by digital transformation, including IoT and Big Data integration. The global maritime sector faces

heightened risks from cyberattacks targeting both shipboard and port operations, particularly critical systems such as the Global Navigation Satellite System (GNSS). Through a systematic analysis of maritime vulnerabilities and risk factors, the study proposes frameworks to mitigate these threats. The research highlights the role of human factors in cybersecurity awareness and the development of a robust cyber safety culture. Furthermore, it evaluates the current awareness levels among maritime students regarding cybersecurity risks and defenses, presenting findings to support industry-wide improvements.

32. Case Study on the Analysis of the Efficiency of the Military Procurement and Supply System

Autor: stud. Serena NĂDRAG, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Conf. univ. Dr. Cătălin POPA

Abstract: This study examines the efficiency of the military procurement and supply system through a structured analysis of its processes. The first chapter provides an introduction to procurement systems in military logistics, defining their role, evolution, and fundamental principles. It also explores the typology of military acquisitions based on criteria such as urgency, funding sources, and lifecycle duration. The second chapter focuses on the modeling and analysis of procurement processes, emphasizing logistics support, planning, and key challenges. It also presents methodologies such as Business Process Modeling (BPM), decision trees, and ERP solutions to optimize procurement efficiency. The study highlights factors influencing the effectiveness of acquisitions and the role of digitalization in reducing time and costs. The final chapters include a case study evaluating real-world procurement scenarios and concluding recommendations for improving military acquisition systems. The findings provide insights for

enhancing efficiency, transparency, and cost-effectiveness in defense logistics.

33. The Logistics Chain in Military Operations

Autor: stud. Cosmin-Ionuț NISTOR, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Filip NISTOR

Abstract: This study examines the military logistics chain, emphasizing its vital role in operational success and the impact of emerging technologies. It provides a historical overview, highlighting the evolution of logistics from a support function to a strategic element. The study explores key logistics principles such as flexibility, speed, and sustainability, analyzing their role in battlefield superiority. It discusses integrated planning, interoperability, and external factors like geography and infrastructure. Key components, including procurement, transportation, and inventory management, are analyzed, with a focus on ICT solutions for real-time tracking and optimization. A case study on a specific military operation assesses logistics planning, identifying strengths and weaknesses. The study concludes by stressing the need for continuous adaptation, investment in research, and the integration of new technologies to maintain an efficient, resilient logistics chain in dynamic operational environments.

34. Analysis of the Impact of Automation and the Use of Alternative Fuels in Port Operations

Autor: stud. Alexandra OTLOCAN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Conf. univ. Dr. ing. Elena-Rita AVRAM

Abstract: Automation and the use of alternative fuels in port operations are key solutions to improve efficiency and reduce environmental impact. Automation optimizes logistical flows, minimizes human error and increases productivity, helping to

reduce operational costs. On the other hand, the transition to alternative fuels, such as liquefied natural gas (LNG), hydrogen or biofuels, reduces greenhouse gas emissions and local pollution, supporting sustainability objectives. Deploying these technologies involves challenges related to upfront investment, infrastructure adaptation and integration into existing supply chains. The study analyzes the benefits and obstacles associated with these changes, highlighting the impact on the economic efficiency and sustainability of modern ports.

35. Optimization of Handling, Storage and Transport Activities at a Container Terminal

Autor: stud. Anamaria PANĂ, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Beazit ALI

Abstract: The graduation project analyzed the methods for optimizing the specific activities of a container terminal. The project begins by making a brief introduction to container terminals, highlighting their role. The logistics system integrated within maritime terminals is analyzed, highlighting modern trends in container handling, storage and transport. The integrated logistics system of container terminals is examined, with a focus on operational flows and the infrastructure required for efficient management. New trends in the field are also discussed, including advanced technologies for container handling, storage and transportation. The goal is to highlight innovative solutions that contribute to the development of logistics efficiency within maritime terminals. The operating strategies used to reduce truck traffic congestion, the methodology applied in the study and the impact of automated strategies on access roads are analyzed. The results of the study provide a concrete perspective on the benefits brought by the improvement of operational processes.

In the last chapter, the conclusions of the paper regarding the implementation of OCR technology in the port of Gdańsk SA, and its impact, are presented.

36. Optimization of Transport and Storage Activities at a Port Operator for Petroleum Products

Autor: stud. Melisa ZEADIN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. ing. Beazit ALI

Abstract: Efficient transport and storage activities are essential for the seamless operation of port facilities handling petroleum products. This paper focuses on optimizing these processes to improve efficiency, reduce costs, and enhance safety. Key strategies include the implementation of advanced logistics management systems, real-time monitoring technologies, and predictive maintenance to minimize downtime. Additionally, automation in inventory control and scheduling helps streamline operations, ensuring timely deliveries and reducing storage bottlenecks. The study also addresses environmental and regulatory challenges, emphasizing sustainable practices and compliance with safety standards. By leveraging data analytics and digital tools, port operators can make informed decisions, optimize resource allocation, and mitigate operational risks. The findings highlight best practices and innovative solutions that contribute to increased competitiveness, reduced environmental impact, and improved overall performance in petroleum product handling at port facilities.

37. Robot for Floating Waste Collection: Design and Realization

Autor: Ing. Andrei-Ioan FRATEA
Îndrumător: Conf. univ. Dr. ing. Ciprian RIZESCU, Universitatea Națională de Știință și Tehnologie Politehnica București

Abstract: This project addresses water pollution caused by floating debris by developing an autonomous robotic arm for waste collection. The system integrates a mechanical arm on a floating platform, using sensors and an optimized gripping mechanism to capture debris efficiently. It features an Arduino-based control system with servo and stepper motors for precise actuation. A vision system or proximity sensors can enhance autonomy by detecting waste. Key design aspects include waterproofing, buoyancy, and energy efficiency, ensuring reliable operation in aquatic environments. This solution aims to automate water surface cleaning in lakes, rivers, and coastal areas, reducing human labor and costs while promoting environmental sustainability.

38. Analysis of Logistics Activities in a Food Distribution Company

Autor: stud. Sergiu-Adrian BORDEA, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Prof. univ. Dr. ing. Beazit ALI

Abstract: Logistics plays a crucial role in the efficiency and competitiveness of food distribution companies. This paper analyzes the key logistics activities within a food distribution company, focusing on procurement, inventory management, warehousing, transportation, and order fulfillment. Efficient supply chain management ensures the timely delivery of perishable goods, minimizes waste, and optimizes costs. The study highlights the importance of technological advancements, such as automated inventory systems and real-time tracking, in

improving logistics operations. Additionally, it examines challenges such as fluctuating demand, regulatory compliance, and maintaining product quality during transportation. By implementing best practices in logistics management, companies can enhance operational efficiency and customer satisfaction. The findings emphasize the need for continuous improvement and adaptation to market trends to ensure a resilient supply chain. This research provides insights into how strategic logistics decisions impact the overall performance of a food distribution company and contribute to sustainable business growth.

OCEANOGRAFIE ŞI HIDROGRAFIE

BIROUL SECŢIUNII
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Membri: Conf. univ. Dr. ing. Dinu ATODIRESEI
Ș.L. univ. Dr. ing. Lucian DUMITRACHE
Sala L244

1. The Theory of Self-Guided Rockets in Drone Construction, with Applications in Oceanography

Autori: stud. Cosmin DUMITRU, stud. Alexandru MANOLESCU, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Lucian DUMITRACHE

Abstract: This paper explores the application of self-guided rocket theory in the design and construction of drones, with a particular focus on their use in oceanography. The study analyzes the fundamental principles of rocket guidance and control, adapting these concepts to improve autonomous navigation, stability, and efficiency of drones in challenging marine environments. Various propulsion technologies and guidance systems are investigated, highlighting how they can be optimized for oceanographic missions such as environmental monitoring, seabed mapping, and marine life surveillance. The paper includes case studies and practical experiments demonstrating the effectiveness of the implemented technologies, emphasizing their contribution to the advancement of oceanographic research. The results suggest that integrating principles from self-guided rocket theory into drone technology offers innovative solutions for ocean exploration and monitoring.

2. The Delimitation of Maritime Spaces in the Context of International Law

Autor: stud. Liliana Elena DAVID (VASILE), Academia Navală „Mircea cel Bătrân", Constanţa
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Abstract: This paper analyzes the delimitation of maritime spaces in international law, from the historical evolution of the concept to current principles and mechanisms. UNCLOS and other relevant conventions are examined, along with the classification of maritime spaces and delimitation principles such as equity and proportionality. International bodies involved in dispute resolution, such as ITLOS and the ICJ, are presented, and the case study regarding the delimitation in the Black Sea between Romania and Ukraine illustrates their application. The paper also evaluates the impact of the current geopolitical context on the ICJ ruling and regional relations.

Keywords: law of the sea, delimitation, maritime spaces, UNCLOS, principles, international bodies, Black Sea, Romania, Ukraine, ICJ.

3. The Ethics of Scientific Research. Exploring the Challenges in Selecting Participants, Data Manipulation and Communication.

Autor: stud. Lili Gabriela MORCOV MANOLACHE (FILIMON), stud. Liliana Elena DAVID (VASILE), Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Lucian DUMITRACHE

Abstract: Actual principles of research ethics are heavily influenced by the normative acts that regulate this field. Universities, research institutions and other similar organizations are required to develop and implement robust ethical guidelines and establish specialized research ethics committees to evaluate and monitor projects from an ethical perspective. The main principles underlying these codes of

conduct are crucial in ensuring ethical and responsible research. They include respect for individual dignity and rights, constant concern for the well-being and safety of research participants, avoiding harm and protecting them from any potential harm, and promoting equality and fairness in the research process and in the use of its results. Respecting and rigorously applying these principles is essential to maintain the integrity and credibility of scientific research.

4. Autonomous Naval Platform: A New Horizont in Oceanographic and Military Research

Autor: stud. Cristian-Felician ZAHARIA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Lucian DUMITRACHE

Abstract: In the context of the rapid technological progress in recent years and the direction in which the world's armies are moving in terms of the robotization of the armed forces, Romania is in a position to abandon vessels with too much experience and to focus on naval drones that can carry out missions that do not require human presence on board. I therefore propose the concept of a marine drone for oceanographic research and military purposes, with electric propulsion, powered by solar panels, that has the ability to dive to protect itself from rough seas, can explore the underwater environment, can launch torpedoes, and can identify enemy movements through a radar installed on board quadcopters.

5. Autonomous Underwater Vehicle for Oceanographical Surveys

Autori: stud. Gabriel Daniel ZAMAN, Cristian Silviu DERMEGEA, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Lucian DUMITRACHE

Abstract: The development and utilization of Autonomous Underwater Vehicles (AUVs) have revolutionized oceanographical studies, offering unprecedented capabilities for deep-sea exploration and data collection. AUVs, equipped with sensors and navigation systems, provide high-resolution mapping, environmental monitoring, and biological sampling without the need for direct human intervention. This paper presents the design, development, and testing of a specially created robot for oceanographical studies and more. A key feature is the modularity of the systems, allowing for rapid changes in purpose and mission. The implementation of this AUV would significantly enhance the efficiency, accuracy, and safety of oceanographical missions, paving the way for more extensive and detailed studies of the Black Sea. Current challenges highlight the potential of autonomous technology in advancing our understanding of the oceans and addressing global issues related to marine conservation and resource management.

6. Basics of Lagrangian Analysis

Autori: stud. Narcis Daniel ANIȚEI, stud. Gabriel MONORANU, stud. Alexandru MANOLESCU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Prof. univ. Dr. habil Dan LASCU

Abstract: Lagrangian analysis is a fundamental approach in classical mechanics that provides a powerful framework for understanding the motion of systems through energy principles rather than direct force calculations. This project explores the basics of Lagrangian mechanics, starting from the principle of least action and the derivation of the Euler-Lagrange equations. Key topics include generalized coordinates, constraints, and the advantages of the Lagrangian approach over Newtonian mechanics. Through illustrative examples such as the simple pendulum and central force motion, this project aims to provide

an intuitive and mathematical foundation for students and researchers interested in analytical mechanics.

7. The Study on the Efficiency of Underwater Research Systems

Autori: stud. Saviana-Cristina BRIȘCUȚ, stud. Alexandru MANOLESCU, Academia Navală „Mircea cel Bătrân”, Constanţa

Îndrumător: Ș.L. univ. Dr. ing. Andra NEDELCU

Abstract: This paper examines the efficiency of underwater research systems, aiming to identify the most effective technologies used in underwater exploration and monitoring. The study will cover key methods and equipment, such as remotely operated vehicles (ROVs), autonomous underwater vehicles (AUVs), and sonar systems. The theoretical section will discuss the advantages and limitations of these technologies, as well as the impact of recent innovations on research efficiency. The practical section will include an analysis of relevant case studies and an evaluation of essential performance parameters for these systems. The conclusions will highlight the most efficient solutions for various research scenarios and potential directions for improving existing technologies.

8. The Influence of Oceanographic Parameters on Sound Propagation in the North-Western Black Sea

Autori: stud. Andreea-Cătălina BUTNARIU, stud. Maria-Daria NANU, Academia Navală „Mircea cel Bătrân”, Constanţa

Îndrumător: Ș.L. univ. Dr. ing. Lucian DUMITRACHE

Abstract: This study investigates the influence of key oceanographic parameters, including temperature, salinity, and water depth, on sound propagation in the north-western Black Sea. Analyzing an experimental dataset containing measurements of sound velocity, temperature, salinity, and

depth, the research examines the relationships between these factors and sound speed. The results indicate a significant correlation between these parameters, highlighting the distinct acoustic characteristics of the study area. The conclusions drawn from this study contribute to a deeper understanding of underwater acoustic processes and offer valuable insights for applications in oceanography and hydrography, particularly in the context of environmental monitoring.

9. Determining the Nature of the Seabed in the Area of Responsibility Using Modern Oceanographic Equipment
Autori: stud. Gabriel-Adrian DEDIU, stud. Mihai CARAGAȚĂ, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Lucian DUMITRACHE
Abstract: Determining the nature of the seabed in the Romanian coastal area is an essential aspect for activities such as navigation, protection of the marine environment, development of coastal infrastructure and management of natural resources. As its nature is unknown in certain sectors, this research aims to identify and classify the sedimentological composition and morphology of the seabed through modern methods of investigation, such as bathymetry, lateral sonar and sedimentary sampling. The study will contribute to a better understanding of sedimentary dynamics, marine habitats and the potential for sustainable economic activities in the coastal region of Romania.

11. Development of a MATLAB Application to Estimate the Displacement of a Drifting Mine
Autori: stud. Andreea-Bianca GRECU, stud. Iulia MIHAI, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Lucian DUMITRACHE

Abstract: This paper explores the influence of hydrometeorological factors on the drift of marine mines in the Black Sea, employing a predictive MATLAB-based model for trajectory estimation. It investigates the effects of temperature, salinity, sea currents, and wind patterns on maritime safety, highlighting the complexities introduced by these factors. The study presents a technological approach that integrates numerical simulations with observational data to model the behavior of drifting mines accurately. By considering the interplay of environmental variables, such as the density variations caused by water temperature and salinity, as well as the forces exerted by sea currents and wind, the paper delivers a comprehensive framework for predicting trajectories. A practical MATLAB application was developed, enabling real-time simulations of mine movement and providing users with visual and analytical tools to assess potential risks. This approach supports the identification and neutralization of drifting mines, contributing significantly to enhancing maritime safety. The findings demonstrate the utility of this methodology for mitigating hazards and suggest potential extensions for broader applications, including pollution monitoring and other drifting objects in marine environments.

12. Assessing Marine Pollution in the Wester Black Sea using Copernicus Satellite Data

Autori: stud. Miruna-Georgiana ICHIM, stud. Ștefan-Vlăduț ONEA, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Conf. univ. Dr. ing. Dinu ATODIRESEI

Abstract: This study investigates the potential of Copernicus satellite data for monitoring and assessing marine pollution in the Western Black Sea. We utilize Sentinel-1 Synthetic Aperture Radar (SAR) imagery to detect oil spills and other pollutants based on their distinct backscatter signatures. Optical data from Sentinel-2 provides complementary information on

water quality parameters, such as chlorophyll-a concentration and turbidity, which can indicate the presence of pollution from land-based sources or algal blooms. By analyzing a time series of Copernicus satellite observations, we identify pollution hotspots and assess their spatial extent and temporal variability. This information is crucial for understanding the sources and impacts of marine pollution in the Western Black Sea and developing effective mitigation strategies. The study highlights the value of Copernicus data for operational marine pollution monitoring and environmental management in the region.

13. Integration and Analysis of Geospatial Information in Maritime Operations Using ArcGIS Pro Software

Autor: stud. Cosmin Alexandru MIELU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Andra NEDELCU

Abstract: This thesis explores the integration and analysis of geospatial data in maritime operations using ArcGIS Pro, with a particular focus on military naval operations, oceanography, and hydrography. The research examines how GIS tools can combine geospatial datasets such as naval traffic, oceanographic data, marine topography, and environmental conditions to support decision-making in military and defense operations. Special attention is given to real-time monitoring of maritime domains, enhancing situational awareness, and improving navigation safety. The study applies spatial analysis, modeling, and visualization techniques to optimize resource allocation, improve mission planning, and ensure effective risk management in military maritime operations. Findings indicate that the integration of these geospatial tools significantly enhances operational efficiency and strategic coordination. The research highlights the practical applications of GIS for naval forces, oceanographic research institutes, hydrographic services, and other defense stakeholders.

14. Mapping Coastal Areas and Coastal Erosion: Methods and Solutions

Autori: stud. Gabriel MONORANU, stud. Narcis - Daniel ANIȚEI, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: Mapping coastal areas and monitoring coastal erosion are crucial for sustainable shoreline management. Coastal erosion, driven by natural forces and human activities, threatens ecosystems, infrastructure, and communities. Effective solutions include hard engineering approaches like seawalls and breakwaters, as well as soft solutions such as beach nourishment and dune restoration. Nature-based solutions, like mangrove and wetland conservation, offer sustainable resilience against erosion. Integrating advanced mapping techniques with adaptive coastal management strategies ensures long-term sustainability and risk mitigation.

15. Maritime Hydrographic Survey Using Unmanned Surface Vehicles

Autori: stud. Maria-Daria NANU, stud. Andreea-Cătălina BUTNARIU, Academia Navală „Mircea cel Bătrân”, Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Lucian DUMITRACHE

Abstract: Recent technological advances have significantly enhanced the capabilities of Unmanned Surface Vehicles (USVs), leading to the diversification and improvement of their functionalities. Used in environmental monitoring, oceanographic research, and freight transport, USVs have become versatile and efficient tools for exploring various geographical areas.

16. Arctic Oceanography and the Impact of Melting Sea Ice on Polar Ecosystems

Autori: stud. Marius Valentin PREDA, stud. Cozmin-Horia ȘORODOC, Academia Navală „Mircea cel Bătrân”, Constanţa

Îndrumător: Conf. univ. Dr. ing. Sergiu LUPU

Abstract: This project is about Arctic oceanography and the profound impact of melting sea ice on polar ecosystems. As the Arctic undergoes rapid environmental changes due to climate change, the loss of sea ice is altering oceanographic processes such as stratification, circulation, and light penetration, which in turn affect primary productivity and the broader marine food web. These shifts threaten ice-dependent species, disrupt traditional habitats, and create opportunities for temperate species to expand their ranges, leading to complex ecological transformations. Additionally, the reduction of sea ice exacerbates global warming through feedback mechanisms like the ice-albedo effect. This project aims to explore these interconnected changes, their consequences for Arctic biodiversity and Indigenous communities, and the implications for global climate systems. By examining the latest scientific findings, this work seeks to contribute to a deeper understanding of these critical issues and inform strategies for conservation and adaptation in a rapidly changing Arctic.

17. Transforming Maritime Education: Integrating Innovative Technologies in the Training of Oceanography and Hydrography Specialists

Autori: stud. Marius Valentin PREDA, stud. Cozmin-Horia ȘORODOC, Academia Navală „Mircea cel Bătrân”, Constanţa

Îndrumător: Conf. univ. Dr. Romeo BOȘNEAGU

Abstract: In today's context of digital transformations and rapidly evolving technologies, maritime education is faced with the need to adapt to the new demands of industry and research in oceanography and hydrography. This presentation explores the integration of innovative technologies, such as advanced simulators, autonomous systems, and big data analytics-into the training of maritime specialists. The study proposes an integrated curriculum update framework to enhance the

practical and theoretical skills of future professionals. The results highlight that the adoption of these technologies not only improves the efficiency and safety of maritime operations, but also contributes to the development of an interdisciplinary perspective essential to address global challenges.

18. Study of Coastline Evolution in the Coastal Area of Romania

Autori: stud. Ionel SCARLAT, stud. Ioan-Lucian DĂNESCU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Lucian DUMITRACHE
Abstract: The evolution of the Romanian coastline is shaped by the interaction of waves, tides, and marine currents. Waves, primarily generated by wind and swell, are the dominant force in the Black Sea, with the North-South orientation of the coast exposing it directly to storm waves and prevailing winds. Although the Black Sea experiences mixed tides, their influence is minimal due to the semi-enclosed nature of the basin. Marine currents, driven by wind action, temperature fluctuations, salinity variations, and river inputs, contribute to coastal processes through upwelling and downwelling. In recent years, coastal erosion has intensified due to factors such as tourism infrastructure development, rising sea levels, water temperatures, sediment deficits caused by dam construction and port infrastructure disrupting marine currents. To mitigate these effects, conservation efforts such as the "Coastal Erosion Reduction" project (2012-2015) have been implemented, focusing on breakwater construction and beach nourishment in areas including Tomis Nord, Tomis Centru, Tomis Sud and Eforie Nord.

19. Data Acquisition for Creating Bathymetric Maps

Autor: stud. Denis Ștefan STAN, Academia Navală „Mircea cel Bătrân", Constanța
Îndrumător: Ș.L. univ. Dr. ing. Lucian DUMITRACHE

Abstract: This article emphasizes the importance of deep-sea exploration and the essential technologies used in research, highlighting both the scientific objectives and the logistical challenges of this undertaking. It presents navigation and sound-based location systems (SONAR), including multibeam sonar, chirp-type sonar for sub-surface profiling, and split-beam echosounders, which enable seafloor mapping and the identification of various relief features or underwater organisms and Doppler current profilers (ADCP) provide data on the speed and direction of ocean currents using the Doppler shift principle.

Keywords: SONAR, ADCP, Multibeam, Hydrography

20. Adrift Mines Destruction with the Help of Divers Team

Autor: stud. Tiberiu-George VÎJU, Academia Navală „Mircea cel Bătrân", Constanța
Îndrumător: Drd. ing. Nicolae-Silviu POPA

Abstract: Destroying drifting mines is a complex and dangerous challenge that requires innovative approaches and specialized teams to solve efficiently and safely. This paper investigates the methods and technologies used by diving teams in this critical mission. The dive team faces numerous obstacles, including extremely dangerous and variable working conditions such as strong currents and poor visibility. To meet these challenges, divers are equipped with specialized equipment, including pressure-resistant diving suits and mine detection and detonation equipment.

A crucial aspect of the process is identifying and locating drift mines, which can involve using underwater sonars and sonar technology to scan large, deep areas of water. After

identification, the dive team must carefully and accurately approach each mine, ensuring that it is deactivated or destroyed without causing additional environmental damage. Effective communication and coordination between members of the dive team is essential to the success of the operation. Each member must be well trained in safety procedures and be able to react quickly and effectively to unpredictable situations.

21. The use of Oceanographic Research Equipment for the Actions of Maritime Unmanned Systems

Autori: Mihai CARAGAȚA, stud. Gabriel-Adrian DEDIU, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Lucian DUMITRACHE

Abstract: Maritime Unmanned Systems (MUS) are playing an increasingly vital role in modern naval and oceanographic operations, providing enhanced capabilities for underwater exploration, surveillance, and environmental monitoring. This presentation explores the integration of oceanographic research equipment into MUS operations, highlighting their role in data collection, navigation, and mission efficiency. Key topics include the types of oceanographic sensors employed, their applications in underwater reconnaissance and scientific exploration, and the challenges associated with their deployment. Additionally, case studies demonstrating successful implementation of such technologies in real-world scenarios will be discussed. By leveraging advanced research tools, MUS can significantly enhance operational effectiveness in both military and civilian maritime missions.

22. Study on the Analysis of Risks Generated by Tsunami and Protection Measures for Harbors

Autor: stud. Andrei COSTAN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Andra NEDELCU

Abstract: This paper examines the risks posed by tsunamis to ships and harbors, highlighting the measures needed to protect and minimize the impact. Tsunamis, although rare phenomena, can cause massive destruction, affecting port infrastructure, ship safety and global economic chains. The main risks include capsizing and collisions of ships, interference with navigation, loss of crew, destruction of port infrastructure and severe flooding. The study stresses the importance of implementing effective strategies such as rapid evacuation of ships, upgrading infrastructure and using advanced disaster monitoring technologies. Through appropriate measures and rigorous planning, risks can be mitigated, protecting both maritime operations and coastal communities. The research results contribute to the development of maritime safety policies and to the optimization of response procedures to such natural disasters.

23. El Nino Phenomenon and Effects of Climate Changes and During Deep-Sea Navigation

Autori: stud. Cristian Silviu DERMENGEA, stud. Lili Gabriela MORCOV (FILIMON), Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Conf. univ. Dr. Romeo BOȘNEAGU

Abstract: El Niño is a climate phenomenon that occurs in the Pacific Ocean. It is characterized by warmer-than-average sea surface temperatures in the central and eastern Pacific. El Niño can have a significant impact on global weather patterns, leading to changes in temperature, precipitation, and storm patterns. Global climate change is also affecting the Earth's weather patterns. The effects of climate change include rising sea levels, more extreme weather events, and changes in the distribution of plants and animals. It is important to understand the effects of El Niño and global climate change so that we can take steps to mitigate their impacts

24. Pollutants in the Aquatic Ecosystems of the Lower Danube Basin and North West Black Sea Region

Autor: stud. Ștefan-Vlăduț ONEA, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Conf. univ. Dr. ing. Dinu ATODIRESEI

Abstract: The continuous release of both natural and human-made organic and inorganic substances into the environment has a significant impact, highlighting the need for a deeper understanding of the chemical state of aquatic ecosystems. Studies monitoring water contamination have been conducted worldwide for various substance categories. Effective management of water resources relies on accurate analytical methods and exposure assessments. This research reviewed numerous publications focusing on the Lower Danube and North West Black Sea region, analyzing both regulated and unregulated persistent and emerging pollutants. Commonly detected contaminants included pharmaceuticals (carbamazepine, diclofenac, sulfamethoxazole, and trimethoprim), pesticides (atrazine, carbendazim, and metolachlor), endocrine disruptors (bisphenol A and estrone), polycyclic aromatic hydrocarbons, organochlorinated pesticides, and heavy metals (Cd, Zn, Pb, Hg, Cu, Cr). Seasonal fluctuations were observed for both organic and inorganic pollutants, and microbial pollution was also examined.

25. Economic Analysis Regarding the Particularities of a Bulk Terminal in the Port of Constanta

Autor: stud. Ionuț STAN, Academia Navală „Mircea cel Bătrân", Constanţa

Îndrumător: Ș.L. univ. Dr. ing. Lucian DUMITRACHE

Abstract: The maritime transport is a complex economic activity that evolves in the same way as the economy,

contributing to its development, being a factor with a significant impact on economic cooperation on a global scale. Freight is the primary concept in the shipping economy. Considering the interdependence between freight, ship and port, we can say that they influence each other, but the main factor in maritime transport is the merchandise/freight that takes different forms from raw materials to finished products, being classified according to the utility offered to the sectors that use it. Romania is an important maritime hub, due to the location of the Port of Constanta (location that provides the link between the markets of the non-sea European countries to Central Asia, Transcaucasia and the Far East through its position at the trade routes), so that its advantages should be exploited to the maximum given the high potential of the maritime transport in the national economy.

25. Evaluation of the Effectiveness of USVs in Monitoring Environmental Conditions in Offshore Wind Farms

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Abstract: The project aims to evaluate the effectiveness of Unmanned Surface Vehicles (USVs) in monitoring environmental conditions and infrastructure in offshore wind farms. USVs, equipped with a variety of sensors, will be utilized to gather real-time data on wind conditions, water temperature, salinity, wave heights, and the status of wind turbines. By using USVs, the project intends to create optimized navigation routes that allow continuous monitoring of wind farm performance and environmental factors that may affect the infrastructure. The proposed solution will be compared to traditional monitoring methods in terms of cost, efficiency, and operational safety. This study will demonstrate

the potential of USVs to provide a more cost-effective, safer, and more reliable alternative for offshore wind farm maintenance, contributing to the sustainable development of offshore renewable energy.

26. Optimizing Accuracy Using Online Surveyor in Coastal Surveying

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Abstract: Using „Topograph Online", combined with state of the art photogrammetry in order to achieve the best precision for measurements on coastal topography. Topograph Online is a equipment that is able to obtain cm precision measurements and with the help of a smartphone it can combine photogrammetry measruements to obtain very accurate and details for costal topography.

27. Hydrographic Measurements for Dredging - Port Constanta

Autor: stud. Ionuț STAN, Academia Navală „Mircea cel Bătrân", Constanţa
Îndrumător: Ș.L. univ. Dr. ing. Lucian DUMITRACHE

Abstract: The port of Constanta is located at the intersection of the commercial routes that connect the markets of the landlocked countries of Central and Eastern Europe with the Transcaucasian Zone, Central Asia and the Far East. It is the main Romanian port and is in the top 10 European ports.The favorable and important geographical position of Constanta Port is highlighted by the connection with two Pan-European Transport Corridors: Corridor VII - Danube (fluvial) and Corridor IV (road and rail). Near Constanta Port are the two satellite ports Midia and Mangalia, which are part of the Romanian maritime port complex under the coordination of the Constanta Maritime Ports Administration.The port of Constanta

is both a sea port and a river port.Maritime port is the surface of water next to a place on the coast, protected naturally or by special hydrotechnical constructions, from waves, winds, currents, where ships can enter, moor, station safely in order to carry out loading-unloading operations or for supply and repairs.