

**“MIRCEA CEL BATRAN” NAVAL ACADEMY**

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CONFERENCE FOR STUDENTS**

**CADET-NAV 2022**

**PROGRAMME**



*07th - 09th of April 2022*  
**CONSTANTA**



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# I. SECTION: NAVIGATION AND TRANSPORT

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Room: L3A6

## 1. Navigating with James Cook

**Author:** stud. Alexandra STAVRE

**Scientific Advisor:** Irina BAKHAYA, PhD

**Institution:** “Alexandru Ioan Cuza” Police Academy Bucharest

**Abstract:** *Throughout centuries, numerous fields of work have gone through the phenomenon of evolution. As far as navigation is concerned, various methods have been developed, mostly by daring explorers who wished to travel around the globe and discover the unknown. James Cook was one such explorer, who used methods devised by his predecessors. However, he also charted accurate maps of the places he had discovered, maps which would be later used by other navigators. His navigational and cartographic skills left a great impression on the world, both traits being added to his wanderlust. Today, we remember him not only as one of the greatest explorers, but also as one of the few people who revolutionized navigation by adding new places to the world map.*

## 2. Weather, Air Temperature and Atmospheric Pressure in the North Sea, English Channel and Bay of Biscay

**Author:** stud. Andrei BACIU-NENCIU

**Scientific Advisor:** Dinu ATODIRESEI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The paper presents meteorological conditions in the North Sea, English Channel and Bay of Biscay for the needs of maritime navigation, meteorological conditions have an important role, especially in terms of changes in atmospheric pressure and wind. Also, the temperature and humidity data condition the production of meteorological events, such as the decrease of visibility, presenting equally interest from this point of view.*

### **3. The Influence of the Trim on the Transverse Stability of the Intact Ships**

**Authors:** stud. Luisa-Patricia BALAȘ, stud. Alexandru BOGATU

**Scientific Advisors:** Mihail PRICOP, PhD, George NOVAC, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The stability of a ship is one of the most significant and difficult concepts in ship and navigation safety, and it is controlled by maritime law and maritime rules. The force of buoyancy produced by a vessel's submerged sections, together with the total weight of its hull, equipment, fuel, storage, and cargo, determines its stability. Trim is one of the most critical factors in ship operation, since changes in trim can impact the ship's stability. Trim by bow and trim by stern are two forms of trim that may be applied to a ship. One of the most important effects of the trim on the ship's stability is overturning, which can occur if the inclination is too high. So.. We'll show how the trim affects the ship's stability, and in the end, we'll use the Autohydro software to run simulations for various loading to and positions, as well as the impact they have on the ship's stability.*

### **4. The Future of Communication at Sea**

**Author:** stud. Vlad-Mihai CHELU

**Scientific Advisor:** Cristina ALECSE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Communication is an important aspect of life at sea, as it assures a safe and reliable voyage. This domain of marineering evolved in accordance with technological progress. The main priority was to solve the problems provoked by the very inhospitable environment of the open-ocean – the emptiness and large distances, the waves, lack of visibility during the night etc. To mend this and to better exploit important trade routes humans begun during the Modern Age to develop new means of transmitting communication at sea. Those filled the shape of visual communication such as maritime signal flags, auditory or special such as those offered by the telegraph, telephone or internet installations. The future opens new and exciting perspectives in perfecting the mentioned methods of communication and a better symbiosis of those to improve significantly the experience aboard.*

### **5. Rescue Equipments for Tankers**

**Authors:** stud. Roxana CIUCIULEACA, stud. Ana Maria INSURATELU

**Scientific Advisor:** Cristina ALECSE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta



**Abstract:** *The project presents measures for life-saving at sea on tankers. All measures relating to life-saving at sea shall be developed and well regulated by SOLAS. The project has a lot of useful information about how we need to deal with different emergency situations at sea.*

## **6. Study Regarding Navigation in the Great Barrier Reef**

**Author:** stud. Iustin-Adrian CIUGOLIA

**Scientific Advisor:** Andrei POCORA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In this presentation I will be going over the characteristics of the Great Barrier Reef and the navigational routes in that area. The Great Barrier Reef, located on the northeastern coast of Australia, is the biggest coral reef ecosystem on planet Earth, it is a complex of coral reefs, shoals and small islands and is home to almost 2000 species of coral and fish combined. Considering the Great Barrier Reef is a protected area there are several rules which were imposed regarding navigation in that zone, rules which will be discussed later in this presentation.*

## **7. Navi General Considerations About the Transport of Break Bulk Cargo**

**Author:** stud. Laurențiu-Robert COCHEȘ

**Scientific Advisor:** Marius APETROAEI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In this presentation I will show the importance of break bulk cargo in the world, plus types, value and the biggest port of break bulk cargo.*

## **8. Study of the Naval Transport System in Poland**

**Author:** stud. Robert COMAN

**Scientific Advisor:** Dumitru CORDUNEANU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The present study was born out of the desire to x-ray the shipping system in Poland in the period 2010-2020 for the purpose of diagnosis. Through statistical research, I set out to outline the dynamics of freight and passenger transport through Polish ports as well as the evolution of the Polish shipping industry in the period 2010-2020.*

## **9. Study of the Influence of Liquid Free Surfaces on the Transverse Stability of the Ship**

**Authors:** stud. Mihaela COSTACHE, stud. Alessia COSTACHE, stud. Ioana-Adriana DINU

**Scientific Advisors:** Mihail PRICOP, PhD, George NOVAC, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: It is known that the free surfaces of the fluids affect the transverse and longitudinal stability of the ship. However, the corrections made on board are only partial and approximately. Perhaps in the past this was enough, but nowadays we must take in account the necessity to dispose of a more extensive and accurate information of the free surface effects and the professionalism of the ship's master, for deciding the use of the information on board, about the level of approximation, or better, the level of accuracy for determining some parameters corresponding to a particular condition of the ship's load. In conclusion the most important aspects are the deviations considering the percentages that results with respect to the values minimums values of the stability criteria (tranverse stability). We worked in Autohydro software where we simulated the increase and decrease quantity of goods on three types of ships, noting influence of free surfaces of the fluids on the static and stability of the ship.*

#### **10. Methods and Equipment for the Rescue of Persons In the Hyperbar Environment At Sea and Their Safe Transportation to Shore**

**Author:** stud. Andrei COTET

**Scientific Advisor:** Dumitru CORDUNEANU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: In this article we analyzed means and devices for rescuing people in hyper-baric environments.*

#### **11. Developing a Software for Dead Reckoning Problems Using Python**

**Author:** stud. Georgiana-Cătălina CRISTEA

**Scientific Advisor:** Elena-Grațiela ROBE-VOINEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: This paper aims to give an insight into the process of building a software from scratch, using Python. In this respect, every stage of building a software will be presented thoroughly, namely: requirements analysis, the software design projection, the computational implementation, the assembling and conversion to a standalone application. Furthermore, there will be made a short presentation of the final product, NavyCalc software, along with its functions, in order to complete both the paper and the process of development.*

#### **12. Marine Pollution. Grande America Container Ship Case Study**

**Author:** stud. Alexandru-Mihai CULICEANU

**Scientific Advisor:** Sergiu LUPU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *My project is about marine pollution, from its beginning, development and continuous growth, but also with solutions we could use in our own advantage. The case study of the container ship Grande America.*

### **13. Technical and Operational Problems in stacking containers**

#### **On board ships**

**Author:** stud. Florin CUTOV

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Basic elements about containers: history, constructions details.*

*Lashing*

*Port-Handling Equipments and facilities.*

*Technical and Operational Problems.*

### **14. Container Lashing**

**Authors:** stud. Ștefania-Crina DINU, stud. Ana GEOGE

**Scientific Advisor:** Livia RAUCA

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The purpose of the paperwork is to show the importance of the correct lashing of the containers in order to ensure the safe transport of the goods to the destination. The content of the essay includes the way in which these containers are lashed, the loading / unloading and the equipment that ensures the performance of this operation. The use of lashing is steadily increasing as a method for load securing on flat racks and in containers. Lashing straps are utilized to tie bulky goods together and to fix them on suitable carriers.*

### **15. Danube - Black Sea Canal**

**Author:** stud. Dorina BOLOHAN

**Scientific Advisor:** Cristina ALECSE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The Danube–Black Sea Canal is a navigable canal in Romania, which runs from Cernavodă on the Danube river via two branches to Constanța and Năvodari on the Black Sea. The canal shortens the distance from the Black Sea to Danube ports by approximate 400 km. The length of the canal is 64.4 km and locations along the canal are referenced by their kilometers distance from the Constanta entrance. Two locks are supporting the navigable canal, which is located in Cernavodă and Agigea. It helps the vessels to go through the canal's elevation smoothly, with a transfer time of around 60 minutes for each chamber. Although the Danube Black Sea*

Canal can see a potential improvement in the future, now it is still one of the most important waterways in the region continuing to serve its purpose in making cargo transport more effective and efficient.

## **16. Navigation in Polar Regions**

**Author:** stud. Dragoș-Nicolae SIMION

**Scientific Advisor:** Sergiu ȘERBAN, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The polar regions remain the most remote regions on the planet, and the least supported in terms of human presence, as well as land, air and sea transportation. The harsh environment, exposed to extreme cold, snow and ice, has been an obstacle to even the most well prepared and planned voyages. This paper covers subjects such as types of ice and ship’s maneuver in ice, going into details about passing through ice, turning in ice, besetment, anchoring, berthing and unberthing in ice.*

## **17. The Conditions of Grains Transport by Sea**

**Author:** stud. Nicoleta-Mihaela ENCIU

**Scientific Advisor:** Andrei POCORA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *This chapter discusses the grain rules proposed by international maritime organization (IMO) for the safe carriage of grain in bulk. The intact stability characteristics of any ship carrying bulk grain must be shown to meet, throughout the voyage, three criteria relating to the moments due to grain shift: (1) the angle of heel due to the shift of grain shall not be greater than 12° or—in the case of ships constructed on or after 1 January 1994—the angle at which the deck edge is immersed, whichever is the lesser; (2) in the statical stability diagram, the net or residual area between the heeling arm curve and the righting arm curve up to the angle of heel of maximum difference between the ordinates of the two curves, or 40° or the angle of flooding, whichever is the least, shall be not less than 0.075 metre-radians in all conditions of loading; and (3) the initial metacentric height, after correction for free surface effects of liquids in tanks, shall not be less than 0.30 m. Before loading bulk grain, the master shall, if so required by the contracting government of the country of the port of loading, demonstrate the ability of the ship at all stages of any voyage to comply with the required stability criteria. After loading, the master shall ensure that the ship is upright before proceeding to sea.*

## **18. Requirements for the Construction of Bulk Carriers**

**Author:** stud. Viorela Petronela FLOREA

**Scientific Advisor:** Cristina ALECSE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *During the “Cadet-Nav” communication session, I will present the Requirements for the construction of bulk carriers. In the introduction, I will discuss some ideas about the Romanian Naval Registry to discover its main mission, to improve the quality of services and to develop the highest standards for ships, crew, passenger safety and protection of the environment. Then I will focus on ships for bulk cargo transport, where I will talk about the body frame system, longitudinal strength, sidewall frame and other elements that are part of the construction of bulk carriers.*

## **19. Description of Weather Conditions in Panama Canal**

**Author:** stud. Marius-Daniel GHEORGHITĂ

**Scientific Advisor:** Andra NEDELUCU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In this presentation we gonna discuss about meteorological conditions in Panama Canal. We'll touch topics like technical specifications, key places on transit, monthly evolution of the weather, differences between Pacific and Atlantic sides, climate change which can affect the navigation.*

## **20. The Fascinating World of Astronomy**

**Author:** stud. Răzvan-Mihai GRIGORE

**Scientific Advisor:** Corina SANDIUC, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Since the beginning of humanity people have observed patterns in the stars and they have wondered if these patterns have a meaning. Astronomy is the study of everything in the universe that is beyond our own planet's atmosphere. Some of the planets in our solar system, our own star, The Sun, and the bright stars can all be seen with the naked eye; however, astronomy can go much deeper, taking advantage of telescopes and other scientific instruments to study other stars and their planets in our galaxy, as well as distant galaxies beyond our own. The aim of this paper is to outline some fascinating facts about astronomy, its history and various branches.*

## **21. Analysis of the Effects and Consequences Associated with Accidents in Containerized Shipping**

**Author:** stud. Silviu HAGI

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In this paper it will be presented the analysis of the effects and consequences associated with accidents in containerized shipping: what is an accident, why accidents occur, how often, what can be done to prevent them and what measures were taken to improve ships in order to avoid casualties.*

## **22. Methods of Mooring Ships**

**Author:** stud. Paul HOMORANU

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Different methods of mooring a ship at the quay.*

*Ship-to-Ship Transfer.*

*Single Point or Single Buoy Mooring.*

*Conventional or Multi-Buoy Mooring.*

*Baltic Mooring.*

*Mediterranean Mooring.*

*Anchor Mooring.*

## **23. Study of Weather Parameters of the Gulf of Thailand**

**Authors:** stud. Ana-Maria INSURĂȚELU, stud. Roxana-Mihaela CIUCIULEACA

**Scientific Advisor:** Andra NEDELCU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The topic is based on the comparative analysis of weather parameters. We choose three ports that belong to the respective bay, and we will analyze the ports physically and geographically. We will follow comparatively the evolution of the weather parameters for each month, from the last four years passing in the tables the minimum and maximum values. We also study their influence on coastal navigation, the measures we will take on board the ship. The parameters that we will analyze are atmospheric pressure, temperature, wind speed, visibility, wind direction, we also take into account the baric relief form.*

## **24. Marine Pollution Risk Analysis with Sewage**

**Author:** stud. Ion-Constantin ȘOLGA

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *According to the Romanian Naval Authority, in the legislative framework for the protection of navigable marine waters against pollution and MARPOL conventions, sewage is a risk factor in marine pollution,*

*especially in the Black Sea and territorial waters of Romania. Sewage are classified into two broad categories: sewage and gray water, from ships from various sanitary facilities. Due to anaerobic bacteria that consume a lot of oxygen, the discharge of wastewater is a high risk in the marine ecosystem.*

## **25. Anchoring Installation at the Container Ship**

**Author:** stud. Dragoş IVANOV

**Scientific Advisor:** Cristina ALECSE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In this presentation I will present you about the existing anchoring systems in the container vessel. This project contains data:*

- *general data on the vessel (container vessel).*
- *existing anchoring installation on the ship*
- *anchoring procedures*

## **26. The Dynamics of Goods and Travel Traffic Through United Kingdom Ports Between 2010-2020**

**Author:** stud. Badr JAMILE

**Scientific Advisor:** Dumitru CORDUNEANU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In this article we analyzed data about the traffic of goods from United Kingdom between 2010-2020 and general data about the country.*

## **27. The Dynamics of Goods and Travel Traffic Through Greek Ports Between 2010-2020**

**Author:** stud. Mohamad JAMILE

**Scientific Advisor:** Dumitru CORDUNEANU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In this article we analyzed data about the traffic of goods from Greece between 2010-2020. This country has a high passenger traffic due to the large number of islands it owns.*

## **28. Solas Requirements for Life-Saving Equipment for Passenger Ships**

**Author:** stud. Maria-Alexandra JIANU

**Scientific Advisor:** Cristina ALECSE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *As part of the project “Solas requirements for life-saving equipment for passenger ships” I will describe the main Solas requirements for existing lifesaving equipment on passenger ships. I will present the main lifesaving equipment found on board passenger ships, such as lifeboats,*

*speedboats and lifeboats. I will present the solas requirements concerning the number of seats required for each equipment but also some theoretical aspects for the emergency equipment.*

### **29. Hydrostatic Analysis and Stability of the Ship Intact**

**Author:** stud. Andrei LENT

**Scientific Advisor:** Mihail PRICOP, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: The Sub-Committee on Stability and Load Lines and on Fishing Vessels Safety (SLF) of the International Maritime Organization (IMO) has undertaken the development of so-called “Second Generation Intact Stability Criteria” (SGISC) with the intention of providing a new set of rules covering those phenomena which are not properly covered by present, mostly semi-empirical, requirements. The first two levels of the envisioned 3+1 tiers structure of SGISC are so-called “vulnerability assessment” levels: most of the discussion has so far been dedicated to these levels. At the highest level there is the so-called “Direct Stability Assessment”, which is also strictly linked with the development of ship-specific “Operational Guidance”. Recent discussion on the topic of “Direct Stability Assessment” (DSA) has touched the issue of “validation” of numerical codes to be employed at this level. Stimulated by, and in view of, the ongoing IMO discussion, this paper presents the results of a recent series of experiments in beam waves (mono-/bi chromatic, irregular) and associated simulations based on a 6-DOF blended code. Nonlinear harmonic and sub-harmonic resonances are observed and simulated.*

**Key words:** IMO; large amplitude ship motions; second generation intact stability criteria; nonlinear roll; sub-harmonic resonance; validation

### **30. Study of the Influence of Waves on Ship Stability**

**Author:** stud. Emanuel LENT

**Scientific Advisor:** Mihail PRICOP, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: Stability is one of the most important properties of the ship. The greatest influence on stability and thus on the possibility of loss of stability have the rolling of the ship on the wave.*

### **31. Search and Rescue at Sea Operations in Romania**

**Author:** stud. Aida-Georgiana MARCU

**Scientific Advisor:** Andrei POCORA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta



**Abstract:** *The research of this topic means the beginning of the first maritime world organization based on services for rescuing people at sea that are in danger. The subject shows the creation of the International Convention for the Search and Rescue at Sea founded in 1979 (SAR '79). The convention was organized by the International Maritime Organization that took place in Hamburg from 9th to 27th of April 1979 and it presents the obligations and regulations of each country that has access to the sea. These terms have to be followed regarding the creation of these services that operate in a territorial area, that include starting a joint operation with the neighboring state or states. In the case when the situation shows that more than one country asks to participate in a commune mission for searching and rescuing of missing persons or in danger, as well as the organization of the search itself and the role of the people who will lead the operation, including the main coordinator's role, and how to be rescued and taken over by each country's naval authorities, establish the reasons of the accident and after that to be handed over to the representatives of the company so the rescued persons can be sent to their home country safely.*

### **32. Sea, Swell and Surf**

**Authors:** stud. Maria Cătălina DAN, stud. Cristina Elena COSTEA

**Scientific Advisors:** Capt. Associate Professor Eng. Dinu ATODIRESEI, PhD, Lt. Lecturer Eng. Andra NEDELUCU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *This paper aims to present some of the characteristics of the following types of waves: sea, swell and surf. In this respect, there will be presented various types of waves, especially those caused by wind. Sea, swell and surf are types of waves that have a profound and widespread impact on maritime operations. Therefore, at the end of the presentation you will be able to have a clear picture of the influence of the wind on the sea conditions along with its effects on maritime operations.*

### **33. The Risk of Loading Grain on Cargo Ships**

**Authors:** stud. Dragoș Ștefan MARIN, stud. Adrian MORARU

**Scientific Advisor:** Sergiu LUPU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The risk of loading grain on cargo ships.*

- *Structural features of cargo ships;*
- *The stability of the cargo ship under loading conditions;*
- *Minimum requirements for loading ships;*
- *Preparing the ship for loading and transport. The cargo plan.*

### **34. The Evolution of Maritime Accidents Between 2010-2020**

**Author:** stud. Cătălina-Ionela MIHAI

**Scientific Advisor:** Andrei POCORA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The aim of this paper is to thoroughly explain the impact that maritime accidents have had on humanity for a decade. Shipping accidents are unexpected events that result in financial loss and properties, damages and either loss of people. Several reasons as human errors, technical failures, natural conditions, shipping factors, route conditions and cargo related factors play role in these accidents. Unfortunately, shipping accidents are inevitable cases of maritime field, in contravention of creative and innovative technologies in shipping sector and execution of precautionary safety rules and regulations. Main purpose of this paper is to investigate the effects of shipping accidents on marine environment.*

### **35. Modern Combat Technologies of the MBNA "Crew" with an Invisible Enemy**

**Authors:** stud. Mirela Andreea CAZAN, stud. Cristian Gabriel HRANICERU

**Scientific Advisor:** Manuela Rossemary APETROAEI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In the last two years, the whole world has been affected by the outbreak of SARS-Cov-2, when on March 11, 2020, the WHO declared a pandemic. The rapid spread of the virus is achieved by air transmission, from person to person, through drops, through contaminated hands or surfaces, with incubation times between 2-10 days, the result being the production of severe respiratory tract infections. The aim of our paper is to show the methods of combating the SARS-COV 2 virus within the ANMB campus, which aimed to minimize the spread of the new Coronavirus among military and civilian students, as well as teachers. The battle with the unseen enemy was waged by the entire crew of the Academy through a sustained campaign to raise awareness of the spread and danger of this deadly virus. Obtaining a hydro-alcohol-glycerinate formula on campus, based on the recipe recommended by the WHO, which was also authorized by the National Institute for Medical-Military Development Research "Cantacuzino", as well as other biocides based on sodium hypochlorite or alcohol, wearing a mask, social distance, mounting UV-C lamps in classrooms and last but not least vaccinating all military and civilian personnel are some of our measures, with which we fought this new Coronavirus.*

### **36. Using of Inert Gas System for Oil Tankers**

**Author:** stud. Valentin-Adrian MIRON

**Scientific Advisor:** Andrei POCORA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract:* Oil tankers carry oil of different grades and quality, having property to produce flammable vapors and gases when loaded for transportation. Even with no cargo on board, there can be harmful flammable gases present in the hold. When the vapor produced by an oil cargo is mixed with certain concentration of air primarily containing oxygen, it can result in explosion which results in damages to the property, marine pollution and loss of life. For safety against such explosion, Inert gas system is used on board. It can be through as a separate inert gas plant or flue gas produced by ship's boiler. Inert gas system is the most important integrated system for oil tankers for safe operation of the ship.

### **37. Defining and Describing Modeling Approaches Using Anylogic Software**

**Author:** stud. Ersin NEZAMALI

**Scientific Advisor:** Andrei BĂUTU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract:* In this paper, I will present the six types of modeling approaches available in Anylogic software: Discrete Event modeling, System Dynamics modeling, Agent based modeling, Dynamic Systems modeling, Multimethod modeling and also the Combining modeling methods. These are the six different viewpoints that the modeller can take when mapping the real-world system to its image in the world of models. Depending on the simulation project goals, the available data, and the nature of the system being modelled, different problems may call for different methods. This paper offers an overview of the most used multi-method model architectures, and discusses the technical aspects of linking different methods within one model.

### **38. The Study of the Influence of the Ship's Forms on the Ship's Resistance**

**Authors:** stud. Maria NICHIFOREASA, stud. Cristian-Traian MARIN

**Scientific Advisors:** Mihail PRICOP, PhD, George NOVAC, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract:* In this scientific paper we will talk about the study of the influence of the shapes of the hull on the ship resistance. In the first part, we will define all the specialized terms: ship resistance, technologies, antifouling, etc. From the selected bibliography we will present the main geometric

*characteristics that influence the ship resistance. In the second part we will perform a simulation for a loaded ship, using the Autohydro and Autopower softwares from Laboratory of the Ship Theory and Construction.*

### **39. Global Maritime Distress and Safety System in Arctic Area**

**Authors:** stud. Robert-Marian PĂTRU, stud. Gabriel POPA

**Scientific Advisor:** Andrei POCORA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In our presentation, it is described the Global Maritime Distress and Safety System (GMDSS) in Arctic area. We are talking about minimum requirements and functional requirements that any ship, while at sea, should be able to perform. GMDSS is represented by VHF, Sart, Navtex, Inmarsat and Epirb, which we explain each one briefly. Area of Operations is divided into 4 zones: A1, A2, A3, A4 (GMDSS sea areas). In Arctic area, the limitations of communications systems in high latitudes and the anticipated low temperature that is available at all points along the intended operating routes must be considered for the above systems. The Polar Code applies to ships operating in polar waters, whether engaged on international or domestic voyages. The effects of cold temperature on battery capacity for survival craft communication systems must be considered to ensure that they can remain available for operation during the maximum expected time of rescue.*

### **40. Optimization problems in transport and distribution networks**

**Authors:** stud. Raluca-Gina POPA, stud. Roberto MANOLACHE

**Scientific Advisor:** Dan LASCU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *We intend to bring to the attention of modeling the transmission and distribution problems, from a certain source to a certain destination, thus achieving connection routes. Analyzing all these aspects, we realized that the totality of sources, destinations, intermediate points and connection routes is called a transmission network. Also, the classic problem of transport and the problem of transport have a special structure, being solved by linear programming methods. In conclusion, by visualizing the elements of such a transport network through a drawing composed of points and arcs, we can arrive at the usual form of presentation of a very important concept in the economic field. Throughout centuries, numerous fields of work have gone through the phenomenon of evolution. As far as navigation is concerned, various methods have been developed, mostly by daring explorers who wished to travel around the globe and discover the unknown.*

*James Cook was one such explorer, who used methods devised by his predecessors.*

#### **41. The Story of the Unlucky Ship MSC ZOE**

**Authors:** stud. Diana-Larisa PRICEPUTU, stud. Marian-Sebastian STRUNGARU

**Scientific Advisor:** Andrei POCORA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The transportation of containers on sea was never an easy job. Many container ship incidents happened over the years, many containers have been lost and much cargo was never recovered. Ship MSC ZOE was one of the unluckiest container carriers. The ship lost approximately 270 containers, which contained general cargo and hazardous substances. How did this happen? Well, in this paper we will present you which are the causes, how much cargo was lost and how much was recovered and if this incident could have been prevented.*

#### **42. LNG - The Characteristics and Properties of Liquefied Natural Gas as a Marine Cargo**

**Author:** stud. Roberto-Cosmin TIMARIU

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Liquefied Natural Gas is natural gas which has been cooled-down to a certain temperature so as to become liquid. The reason for this is to ease-up it's transfer and transportation. Natural gas is seen as an alternative source of fuel for automotive vehicles but it is used for other purposes as well and so, as the world turns towards cleaner sources of energy, the demand for LNG is growing at a fast pace.*

#### **43. Lighthouses on the Romanian Coast**

**Authors:** stud. Lavinia Maria ROIU, stud. Izabela Alexandra OȚELEA

**Scientific Advisor:** Lieutenant Eng. Andra NEDELICU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The Romanian coast, being located from Vama Veche to the Ukrainian border at Musura Bay, in addition to ports, bays and many beaches, also has lighthouses that help guide us when we are on the ship and approaching the shore. The lighthouse is a special tower-shaped construction, with its characteristic appearance and color, to easily distinguish the day against the surrounding background. At the top is an installation that produces visible light at night from a distance of over 15 nautical miles. The lighthouses are built in special places (heads, islands,*

cliffs, dikes), and their precisely determined position is represented on the sea charts, thus constituting "navigation landmarks" where reliefs are taken to determine the ship's point at sea.

#### **44. Study on the Operating Principles of Liquefied Gases**

**Author:** stud. Andrei ȘERBAN

**Scientific Advisor:** Andrei POCORA, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *In my paper I talked about the main notions when it comes to liquefied gases. I focused more on the accidents that happen on board the ship when we talk about their transport and how we can prevent them but also how to stop them.*

#### **45. Sea Survival Techniques**

**Authors:** stud. Camelia-Bianca ȘTEFAN, stud. Madalina-Valentina TUDOSE

**Scientific Advisor:** Cristina ALECSE, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *In this project, we wanted to present some survival techniques on the ship, as well as crisis situations and search and rescue operations based on frequently used search patterns.*

#### **46. Grounding (Stranding) Ship**

**Author:** stud. Ștefan ROTARU

**Scientific Advisor:** Andrei POCORA, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *Even the technology and automatic systems take place in every single day of our professional life, the accidents can occur due the different reasons. In the maritime transport field, stranding(grounding) of the ship is a serious danger that can leads to loss of life, destruction of the ship, an environmental catastrophe, loss of the goods. According with statistics, stranding of the ship is divided into two main categories: a) natural circumstances b) human errors. In most cases, the real cause of the accident is not the heavy weather, just ignoring by the master (OOW – Officer of the whatch) the safety rules of sailing, and the requirements of the other guidance documents. Risk of stranding shallow is greatest when the ship is sailing in less studied areas in channels, narrow straits, near shore and shallow or approaching them, especially when sailing in restricted visibility. When sailing in such conditions, and when the position of the ship is not specified, the master is obliged to observe certain safety measures: Watchful observation, combined with excellent knowledge of the area for sailing, is*

*the first condition for increasing the distance of spotting the danger, and preventing an accident. The most effective action to prevent the ship stranding, when the danger is spotted before touching the bottom is to use the main engine/s. Prevention of the destructive force effects: when the ship is stuck in the shallows with a move, it reduces her draft as a result of which the ship losses some displacement. To determine the reaction force immediately after the stranding the measures of the bow, and stern draft should be done. Taking into account the consumption of fuel, water and supplies, the bow, middle, and stern drafts have to be calculated before the stranding. Measures to refloat the ship by using natural forces combined by your own engine (if is possible) or by asking help. Make a continuous survey to not get the destruction to the structural frame of the ship. Apply procedures specific to this situation. Verify the check list.*

**Keywords:** *grounding (stranding), risk, human errors*

#### **47. Cybersecurity in Shipping**

**Authors:** stud. Marian-Sebastian STRUNGARU, stud. Diana-Larisa PRICEPUTU

**Scientific Advisor:** Andrei POCORA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Cybersecurity is the practice of protecting critical systems and sensitive information from digital attacks. These cyberattacks are usually aimed at accessing, changing, or destroying sensitive information; extorting money from users; or interrupting normal business processes. Cyber attacks hit businesses and private systems every day, and the variety of attacks has increased quickly. Corporations are vulnerable to cyber attacks, but ships are targets too and hackers can interfere with the operation of the ship or navigation systems, cut off all external communications of the vessel, or obtain confidential data. In this paper we will present which are the vulnerable systems, how should be the cyber risk approached, what roles, responsibilities, and tasks exist in cybersecurity, how we can identify threats and how we can develop protection measures.*

#### **48. ISSGOT – Shipboard Operations**

**Author:** stud. Gabriel-Marian TEGA

**Scientific Advisor:** Gabriel-Marius APETROAEI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *This presentation provides an overview of the content of ISSGOT, chapter 12 – Shipboard operations, presenting special provisions regarding safe handling of cargo, different types of loading procedures, and risks that may occur. Also, it offers a general presentation of the procedures which*

*shall be taken into consideration by responsible officers and company's SMS regarding the different types of shipboard operations.*

#### **49. Maneuvering the Ship in Bad Weather**

**Author:** stud. Radu-Alexandru TUDORAN

**Scientific Advisor:** Lieutenant Eng. Andra NEDELCU, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *In this paper we will talk about the behavior of a ship when the weather conditions are unfavorable. The quality of crew training is key to a safe voyage. The ways of approaching the values but also the basic notions such as rolling and pitching will be debated in these works. Also, first of all, the preparations made on board the ship before a voyage in which the difficult sailing conditions are recorded will be reviewed.*

#### **50. Study on the Shipping System in France. Scientific Research, 2010-2020**

**Scientific Advisor:** Dumitru CORDUNEANU, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *The following paper contains scientific data and statistics related to inland waterways transport in France. Also presented are the main inland waterways ports of France, each having mentioned exact data related to TEU transport in the period 2010-2020.*

#### **51. Containment Systems for LNG Carriers**

**Author:** stud. Vlad-Ion VOCHIȚU

**Scientific Advisor:** Lieutenant Eng. Andra NEDELCU, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *The paper does a short analysis of types of freight tanks used in LNG transportation, tanks which further determine the type of ships used in this sort of commercialization.*

#### **52. Car Carrier Incidents – a Catalyst for Change**

**Author:** stud. Adrian-Alexandru NEGOITA

**Scientific Advisor:** Gabriel-Marius APETROAEI, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *This paper highlights some of the issues specific to car carriers, how those risks can be addressed, and provides helpful and practical advice for all seafarers and ship operators, or managers working with these ships. There have been a number of serious incidents involving car carriers and other Ro-Ro passenger ships over the years. These incidents were the*



*catalyst for a number of radical changes to the way that these ships are operated and new design features to improve the stability and safety.*

### **53. Arctic Ocean Weather and Climate**

**Author:** stud. Adrian-Gabriel COMĂNESCU

**Scientific Advisor:** Sergiu ȘERBAN, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *With a total area of 13,986,000 square kilometers, the Arctic Ocean is the world's shallowest and smallest ocean. It is surrounded by countries such as Greenland, Alaska, Canada, Russia, and Norway, and is situated around the North Pole. Long, frigid winters and short, cool summers characterize the climate of the Arctic Ocean. The Arctic Ocean is subjected to a very cold climate due to its higher latitude and the presence of ice, snow, and water. The Arctic Ocean is subjected to a very cold climate due to its higher latitude and the presence of ice, snow, and water. The four seasons of the Arctic Ocean are determined by the amount of sunlight available: winter (November through February), summer (about June 21), spring (March and April), and fall (September and October). The months of January and July are the coldest and warmest in terms of temperature, respectively. The Arctic ocean temperature is primarily influenced by summer temperatures.*

### **54. Air Pollution Associated with Containerized Shipping**

**Author:** stud. Gabriel-Alexandru AXINTE

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Air pollution is considered one of the most significant environmental risks to health with substantial economic consequence. As a leading source of air pollution in port and coastal cities and due to the increase in the need for maritime transportation and intercontinental shipping, with over 90% of goods transported on sea; ships need to abide to higher standards and regulations in regards to tackling air pollution. Most ships have diesel engines which, during the fuel combustion process, produces exhaust gases that end up in the atmosphere. The exhaust gases emitted that pollute the environment are mostly nitrogen oxides (NO<sub>x</sub>), sulphur oxides (SO<sub>x</sub>), and particle matter (PM<sub>2.5</sub>).*

### **55. The Quality of the Electricity and the Effects of the Short Circuit Onboard Vessels**

**Authors:** stud. Luisa-Patricia BALAȘ, stud. Stefan-Codrin BITERE

**Scientific Advisors:** Gheorghe SAMOILESCU, PhD, Cătălin DEMIDOV, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The paper examines the factors that influence electricity quality, consumer safety indicators, European standards for establishing technical requirements, and problems that arise in the operation of electrical equipment and installations. The safety of electrical equipment and installations is largely dependent on the extent to which the processes and causes that lead to their occurrence have been investigated. The quality indicators for electricity were examined, as well as the requirements they must satisfy.*

## **56. Environmental Impact of the Petroleum Industry**

**Author:** stud. Dan-Constantin BALCAN

**Scientific Advisor:** Dinu ATODIRESEI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Petroleum is vital to many industries and in the manufacture of a wide variety of materials. It accounts for a large percentage of the world's energy consumption and thus it has a big environmental impact. Setting and enforcing environmental regulations in the petroleum industry are important for minimizing the potential environmental impacts and protecting human health and the environment.*

## **57. Cargo Ships 101**

**Authors:** stud. Ștefan-Codrin BITERE, stud. Sabin-Ionuț MOLDOVEANU

**Scientific Advisor:** Carmen ASTRATINEI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Our study covers the following realities of naval life by understanding the principles of operation of cargo ships. Beginning with a brief historic of ships following with special features of the cargo ships and how it stands out from the rest and some of the specific mechanical parameters and aspects about navigation.*

## **58. Methods for Determining the Influence of Roughness and Appendages on the ship Resistance**

**Authors:** stud. Cristian BREABĂN, stud. Alexandru-Daniel BURLACU

**Scientific Advisors:** Mihail PRICOP, PhD, George NOVAC, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Ship Resistance and Propulsion is dedicated to providing a comprehensive and modern scientific approach to evaluating ship resistance and propulsion. The study of propulsive power enables the size and mass of*

*the propulsion engines to be established and estimates made of the fuel consumption and likely operating costs. This paper presents the latest developments from applied research, including those in experimental and CFD techniques, and provides guidance for the practical estimation of ship propulsive power for a range of ship types. With the help of the AutoHydro and AutoShip programs loaded the ship in three displacements (100%, 75% and 50%), after that calculated the ship resistance with different roughnesses (150 and 450 micrometers) for different form factors of the appendages.*

### **59. Environmental Problems in the Black Sea**

**Author:** stud. George-Madalin CALOTA

**Scientific Advisor:** Dinu ATODIRESEI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: The Black Sea is a unique, virtually contained, and fairly deep (maximum depth of 2212 meters) sea body shared by Bulgaria, Georgia, Romania, Russia, Turkey, and Ukraine, with an area of 461 000 square kilometers and a volume of 540 000 cubic kilometers. A substantial influx of fresh water from two of Europe's greatest rivers, the Danube and the Dnieper, as well as the Dniester, Don, Kuban, and a number of smaller rivers, keeps its shallow, mixed surface layer relatively low salinity. The drainage area is almost 2 200 000 square kilometers in total. Fresh water influx is predicted to be 350 cubic kilometers per year. Precipitation falling over the Black Sea area contributes a modest amount (230 cubic kilometers per year).*

### **60. Evolution of Cargo Traffic in Portugal Ports**

**Author:** stud. Nicolae CIOBANU

**Scientific Advisor:** Dumitru CORDUNEANU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: I have analyzed the cargo and ships traffic from ports in portugal and how they developed between 2010 - 2020.*

### **61. The Wind Energy**

**Authors:** stud. Nicoleta-Roxana CIOCIA, stud. Antonio-Cosmin PISICĂ

**Scientific Advisor:** Gheorghe SAMOILESCU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: The wind energy is the continuous energy produced by the force of the wind. The modern wind turbines are used for transforming the energy captured from the wind in electric energy. The system is based on a very simple principle. The wind gusts are moving the blades which in turn acts*

*an electric generator. The wind is a green source of renewable energy which does not lead to environmental pollution.*

## **62. Lashing of a Heavy Lift Cargo Unit Onboard the Vessel**

**Author:** stud. Claudiu-Ionuț ILIE

**Scientific Advisor:** Andrei POCORA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Presented as cargo units with abnormal dimensions and being overweight, the heavy lift cargoes can be seen as problematic when it comes to transporting by sea. Their overall increased dimensions and weight will impose special attention regarding the securing onboard the vessels. As the most important aspect for vessels when underway is to have a good stability, the securing of cargo onboard becomes a priority. This paper aims to show how heavy lift cargoes can be secured onboard the vessels by discussing the lashing of a 250 metric tons cargo unit onboard a vessel.*

## **63. Considerations Regarding the Liquefaction of Solid Goods in Bulk Liquefaction Incidents of Mineral Cargoes on Board Bulk Carriers**

**Author:** stud. Alexandru Gabriel COJOCARU

**Scientific Advisor:** Gabriel-Marius APETROAEI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Liquefaction of solid goods, words that sound harmless to a common folk, but worrying to a seaman. The liquefaction of solid goods in bulk does not only mean a loss of cargo, but a detriment to the environment. The paper proposes to shed light upon the issues regarding the liquefaction of solid goods in bulk, as well as the exposure of such incidents.*

## **64. Meteorological and Hydrometeorological Parameters in the South Atlantic**

**Author:** stud. Bogdan COJOCARU

**Scientific Advisor:** Romeo BOȘNEAGU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Most of the South Atlantic Ocean is occupied by currents that form a counterclockwise flow. The equatorial current from south to north has a westerly direction, and the southerly current also has a westerly direction, but at a slower speed. This weaker and almost constant current is called the southern subtropical current. Most of the southern equatorial currents change direction to the northwest near the West Indies and off the coast of Brazil. In the southern part of the current area it reaches a speed of two nodes. The southern subtropical currents that change direction to the*

southwest near the coast of Brazil give rise to the Brazilian current that extends and flows southwest parallel to the coast in the area 34°S-37°S.

## **65. Hydrometeorological Characterization of the North Atlantic**

**Author:** stud. Răzvan COJOCARU

**Scientific Advisor:** Romeo BOȘNEAGU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** Spain suffers from frequent river flooding due to specific climatic and topographic features. Many headwaters of the largest rivers in Spain are located in mountainous areas of mid-to-high elevation. These include the Pyrenees, the Central System, and the Cantabrian mountains, that have a sustained snowpack during the winter months. Most previous research on flood generation in Spain has focused on intense rainfall events, and the role of snowmelt has been ignored or considered marginal. In this paper we present a regional-scale study to quantify the relative importance of rainfall versus snowmelt in the largest floods recorded in mountain rivers in Spain during the last decades (1980–2014).

## **66. Cyber Attacks**

**Authors:** stud. Ianis-Nicholas CONSTANTINESCU, stud. Cristian Mihai CHIVU

**Scientific Advisor:** Florin POSTOLACHE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** Such an attack suggests how an individual exploit the vulnerabilities that exist in a given system (server, computer, network device, application, etc.). The most common attacks on the Internet are:

## **67. Considerations on the Safe Operation of Petroleum Terminals**

**Author:** stud. Răzvan-Costin EFIMOV

**Scientific Advisor:** Gabriel-Marius APETROAEI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** In practice, port operations contribute today to the more frequent use of new concepts, in terms of port activities, in this case, port areas and port terminals. The concept of port area is very important for the correct handling operations. It consists in dividing the port into areas parallel to the landing - i.e., the area in which ships with the shields of the dock, where the cranes are installed and the load is not stored. This area is followed by other similar areas, and the more it is from the dock, the more land available for the storage of the goods.

## **68. Study of the Dynamic Behaviour of the Ship on the Sea**

**Author:** stud. Ana-Cristina GEICĂ

**Scientific Advisor:** Greti MANEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In order to study the dynamic behavior of ships navigating in severe environmental conditions it is imperative to develop their governing equations of motion taking into account the inherent nonlinearity of large-amplitude ship motion. The purpose of this paper is to present the importance of a thorough analysis of the rolling. The study was exemplified for the training ship Mircea, on a shipping route in the Mediterranean. The originality of the work is given by the use of Octopus Software for modeling the navigation environment and highlighting the geometry of the ship and the characteristics of buoyancy and stability.*

## **69. Study on the Cleaning of Cargo Warehouses on Bulk Carriers**

**Author:** stud. George Iulian Ghenu

**Scientific Advisor:** Raluca-Aurora APOSTOL-MATEȘ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *A bulck carrier or bulker is a merchant ship specially designed to transport unpackaged bulk cargo, such as grains, coal, ore, steel coils, and cement, in its cargo holds. Since the first specialized bulk carrier was built in 1852, economic forces have led to continued development of these ships, resulting in increased size and sophistication. Today's bulk carriers are specially designed to maximize capacity, safety, efficiency, and durability.*

## **70. The Sinking of M/V Estonia – Search and Rescue Operations**

**Author:** stud. Gabriela GHIORGHIU

**Scientific Advisor:** Dumitru CORDUNEANU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *My paper it's about the sinking of M/V Estonia and the search and rescue procedures followed by the disaster. The sinking of the M/S ESTONIA in the early morning of September 28, 1994, the vessel sank rapidly, with almost no warning to those onboard. ESTONIA sank in international waters of finland's search and rescue region (SRR) in the maritime SRR of the Archipelago Sea, under the responsibility of the Maritime Rescue Coordination Centre (MRCC) in Turku. As a result, Finland was responsible for the overall coordination of the search and rescue operation (SAR). On the night of the accident there were four large passenger ferries on the Finland-Sweden route, MARIELLA and SILJA EUROPA sailing westwards and ISABELLA and SILJA SYMPHONY to the east. Another passenger ferry, FINNJET, sail from Finland to Germany. An*

*expert group was set up within the International Maritime Organisation (IMO) shortly after the accident, with the task of investigating all safety-related aspects of ro-ro passenger ships. The Group submitted a report to the Maritime Safety Committee (MSC) in May 1995 and work continued in preparation for a SOLAS conference to be held at IMO headquarters in the last week of November 1995.*

## **71. Study on the Cleaning of Cargo Tanks for Chemical Tankers**

**Author:** stud. Alexandru ION

**Scientific Advisor:** Andrei POCORA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Chemical cargoes are of extremely high purity and could be contaminative, reactive or incompatible with each other. Delivering the cargo in a condition that is as pure as possible at the loading port constitutes the main goal of chemical cargo transportation. After discharging a cargo, it is absolutely critical to make the tanks free of all possible contaminants and make them ready for the next cargo to be loaded. Despite tank cleaning procedures and contaminant detection methods, costly cargo contamination may still be encountered due to dirty remained ship's tanks. In this study, a comprehensive risk assessment is carried out in order to develop risk prevention strategies by increasing the efficiency of tank cleaning operations. A “Dirty Tank Model” is constructed with a Bayesian Network to obtain factors causing dirty tank and investigate them with their causal relationships. Due to insufficient data for the study, expert opinions are used as a mandatory data source utilising Fuzzy Set Theory. The root causes related to the dirty tank are identified following comprehensive reasoning inquiries performed with those experts. The results provide effective information for developing appropriate risk strategies and tailoring them depending on the different conditions related to the tank cleaning processes.*

## **72. Navigation on Canals and Straits**

**Author:** stud. Adrian-Viorel IONIȚĂ

**Scientific Advisor:** Lieutenant Eng. Andra NEDELCU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Maritime canals and straits play a relevant role in sea transport, they shorten navigation time in transport of cargoes between sea ports and contribute to reduce transport costs. They have passed through the reconstruction and modernisation to adapt the present requirements of maritime transport because of the increase of the volume of cargoes that is transported by this mode of transport. International straits, canals and*

archipelagic sea lanes are convergence points of navigation routes, but there are also what might be termed oceanic convergence points where vessels round prominent points of land.

### **73. Marine Evacuation System (MES)**

**Author:** stud. Antonia Andreea MIRLENEANU

**Scientific Advisor:** Cristina ALECSE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In this presentation I will exhibit the Marine Evacuation System of the Ship (MES) Celebrity Solstice. I will emphasize both the importance of the system, presenting 4 ways in which it launches, and on the primary actions in a life raft / MES. Also, I will describe the capacity of a raft / MES, their numbering, but also how many such equipment are aboard the ship Celebrity Solstice.*

### **74. Loading – Discharging Installation for An Oil Tanker 3700 DWT**

**Author:** stud. Bogdan-Dumitru MIRON

**Scientific Advisor:** Gabriel-Marius APETROAEI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The petroleum products are loaded/discharged at the ship through the piping system that provides through various valves the most suitable loading wires. The loading of the oil tankers does not require the pumping installation of the ship because the pressure necessary to push the liquid through the pipes is provided by the terminal installation depending on the loading rate. However, the unloading of the oil tanker requires pumping installations specific to the ship in which the main role is played by the cargo pumps located in a special compartment called the pump room.*

### **75. Study on the Impact of Maritime Transport on Air Pollution**

**Author:** stud. Răzvan – Valentin MITREA

**Scientific Advisor:** Sergiu LUPU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In students’ scientific session of communication entitled " Study on the impact of maritime transport on air pollution " i am going to present an introduction to pollution, defining marine pollution as the first harmful factor of the oceans, seas, air and human health through the different types of pollutants produced by ships and also The impact of air pollution during the COVID-19 pandemic.*



## **76. Navigational System in Spain. Ports of Spain**

**Author:** stud. Florin-Teodor MOROIANU

**Scientific Advisor:** Carmen ASTRATINEI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Spain also has many maritime communications, with more than 53 internațional ports on the Atlantic and Mediterranean coasta. In particular the port of Algeciras, Spain only world-class considered by its large passenger traffic and freight traffic, as well as the port of Vigo which is also one of the business in terms of traffic, catching live fish and frozen. The port of Seville is on a unique distinct river, which exists in the country, as if the city is inland, it has no acces to the sea over the Guadalquivir River.*

## **77. The Study and Planning of the Ship's Voyage Based on Nautical Publications**

**Author:** stud. Alessandra – Gabriela ONOFREI

**Scientific Advisor:** Lieutenant Eng. Andra NEDELUCU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *For maritime navigation, known also like the movement from one port to another, to the ship a series of activities are carried out, from the technical training of the ship, to the preparation of the devices, instruments and means necessary for the navigation. Apart from the devices and installations on board, nautical documents are also very important.*

## **78. The Evolution of the Naval Traffic on the Danube-Black Sea Canal in the Period 2019-2020**

**Author:** stud. Irina-Mihaela OPRICĂ

**Scientific Advisor:** Cristina ALECSE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The aim of the study is to highlight the evolution of naval traffic on the Danube-Black Sea Canal in the period 2019-2020. Danube-Black Sea waterways an important part of the European waterways between the Black Sea and the North Sea (On the Rhine-Main-Danube canal). Every year the Danube-Black Sea canal is traversed by thousands of ships. This statistical analysis of naval traffic for the period 2019-2020 includes the total number of incoming ships, outgoing ships and the total tons of goods transported on the Danube-Black Sea Canal.*

## **79. German Naval Transport System Statistical Research, 2010-2020**

**Author:** stud. Sebastian George PAICU

**Scientific Advisor:** Dumitru CORDUNEANU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *My paper it's about the german naval transport system and it's a statistical research between 2010 and 2020. Germany has one of the most developed inland navigation systems in the world due to all the rivers flowing or flowing through this system. In Germany, the two major universal ports of Hamburg and Bremen/Bremerhaven play a leading role in the intercontinental container transport market. From a hydrological point of view, the territory of the Federal Republic of Germany is divided into the river basins of the rivers Danube, Rhine, Ems, Weser, Elbe and Oder, the tributaries of the river Meuse and the coastal regions of the North and Baltic Seas.*

### **80. Study of Stability Criteria for Different Types of Vessels**

**Author:** stud. Cătălin-Constantin PĂVĂLUCĂ

**Scientific Advisor:** Mihail PRICOP, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *In my present licence entitled 'Study of stability criticisms for different types of ships', I chose to discuss in particular in a detailed way the stability conditions of different types of ships, such as: Bulk cereal carriers, container vessels, offshore supply vessels, mobile offshore drilling units and fishing vessels. In this document I have to draw up a brief prediction of the types of vessels and their stability with regard to some basic factors.*

### **81. Methods and Techniques Used for Survival in Low Temperature Waters**

**Author:** stud. Ana-Alexandra PETRO

**Scientific Advisor:** Dumitru CORDUNEANU, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *I will present a project in which I will talk about how a person should react in case after a naval accident he will encounter water with low temperature. I will talk about how a person should proceed in this situation in order to prolong his chances of survival.*

### **82. Comparative Study Between Classic Maritime Maps and Electronic Maps**

**Author:** stud. Adrian RADU

**Scientific Advisor:** Lieutenant Eng. Andra NEDELICU, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *In my opinion, electronic maps have become very used and necessary. In this presentation i will talk about the importance and development of electronic diagrams in the life of the seaman. Information on*

*how electronic maps have become widely used and what they contain. Presentation of a series of terms and definitions of electronic diagrams as well as the distinction between official and unofficial graphics.*

### **83. Operation and Maintenance of Hatch Cover for Bulk Carrier**

**Author:** stud. Mihai RAȘCU

**Scientific Advisor:** Livia RAUCA

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The presentation will include practical guidance to ship’s officers and crew, technical managers, surveyors, lawyers and claims handlers in the operation and maintenance for hatch cover. Briefly overview hatch cover design principles, safety aspects of hatch cover operation and maintenance, routine checklist to be used onboard in connection with the operation and maintenance of hatch cover*

### **84. Naval Architecture**

**Authors:** stud. Camelia-Bianca ȘTEFAN, stud. Madălina-Valentina TUDOSE

**Scientific Advisor:** George NOVAC, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Naval architecture is a fascinating and demanding discipline. It is fascinating due to the variety of floating structures and the large number of compromises required to obtain a product as efficient as possible. In our project we want to present the steps that are needed in the design process of the ship. Ships are vital to the economy of some countries. They represent the means of transport for about 95% of world trade with an annual capacity increase of about 2%. Even though airplanes have taken over passenger transport, there is a significant percentage of passengers who prefer to travel for pleasure on cruise ships in different parts of the world or to travel short distances with ferries. Specialized ships and marine structures are used to exploit resources in the submarine soil. Although they are one of the oldest means of transport, ships have undergone a continuous process of evolution.*

### **85. Navigation through Sea Ice in Artic Ocean**

**Author:** stud. Dumitru-Gabriel IATAN

**Scientific Advisor:** Sergiu ȘERBAN, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In this paper I will talk about navigating the icy waters of the Arctic Ocean. Navigation through ice is dangerous due to the nature of the ice because many naval officers do not realize the danger posed by its*

*harshness. The first principle of successful ice navigation is to maintain freedom of maneuver. Once a ship is trapped, the ship will be guided by ice. Ice navigation requires a lot of patience and can be a tiring affair with or without an icebreaker escort.*

#### **86. Study on Navigation in the Antarctic Area**

**Author:** stud. Silviu Andrei MIRON

**Scientific Advisor:** Andrei POCORA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In this paper I will discuss the characteristics of the Arctic Ocean, the visibility of glaciers, the detection of glaciers with radar, navigation routes in this area, the maneuvering of the ship through ice and why navigation in this area is different.*

#### **87. Analysis of Naval Traffic Control Procedures on the Danube-Black Sea Canal**

**Author:** stud. Nicolae-Antonio MOGA

**Scientific Advisor:** Cristina ALECSE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The Danube, the second largest river in Europe after the Volga and the third largest in terms of economic importance, is 2 840 km long and crosses a total of 4 capitals and 10 countries. With a long history in commercial transport, the Danube is connected to the Black Sea by the Danube-Black Sea Canal. The economic importance of this river stems from its large shipping capacity at a much lower cost than other types of transport. A statistical analysis was carried out on the naval traffic regarding the conditions that vessels must meet in order to transit the canal.*

#### **88. Traffic Evolution on Channel Poarta Albă-Midia -Năvodari in the Period 2019-2021**

**Author:** stud. Diana Bianca MUNTEANU

**Scientific Advisor:** Cristina ALECSE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The purpose of the study is to highlight the evolution of naval traffic on the Poarta Alba - Midia - Navodari Canal in the period 2019-2021. The Poarta Alba - Midia- Navodari waterways represent an important part of the European waterways. Every year the Gate White - Midia- Navodari canal is traversed by thousands of ships. This statistical analysis of naval traffic for the period 2019-2021 includes the total number of incoming ships, outgoing ships and the total tons of goods transported*

## **89. The Global Navigation Satellite System GALILEO**

**Author:** stud. Andrei Cosmin PETRE

**Scientific Advisor:** Eduard MIHAI, PhD

**Institution:** Academia Forțelor Aeriene “Henri Coandă”

**Abstract:** *Galileo is a global navigation satellite system (GNSS) created in 2016 by the European Union, intended primarily for civil use. The main purpose of Galileo is to provide an independent high-precision positioning system. The level of precision of the European system is considered superior to that offered by GPS, being able to provide horizontal and vertical measurements with an accuracy of 1 meter, as well as positioning services at high latitudes much improved compared to the current ones. Galileo will be made up of 30 satellites positioned in three medium orbits, 10 in each inclined orbital plane. This paper analyzes the whole operating system, the advantages and disadvantages of using the Galileo system and its future development. There will be a presentation that will include information about: the history of the Galileo system, financing, satellite clocks, satellite signals, users and services.*

**Keywords:** *civil use, high-precision, accuracy, satellite clocks*

## II. SECTION: ENGINEERING AND MANAGEMENT

### Section Committee:

#### Chairman:

CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

#### Members:

Assoc. Prof. Eng. Mihai BEJAN, PhD

Lecturer Eng. Rita AVRAM, PhD

Lecturer Corina SANDIUC, PhD

Room: CP06

### 1. Analysis of Air Pollution and Perspectives for the Black Sea Area

**Author:** stud. Anca Ana-Maria MIHALCEA

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Ship-source air pollutants contribute to global warming and can also be detrimental to the environment and human health, affecting almost 40% of Europeans living within 50 km of the sea. The combustion of marine fuels containing sulphur contributes to air pollution in the form of sulphur oxides (SOx). IMO designated Emission Control Areas (ECAs), in order to reduce the SOx emissions, by setting restrictions on the percentage of sulphur in the fuel. According to a study of the Black Sea region, 545.72 kilo-tonnes SOx are dispersed annually. The Romanian coastal area is in an unfavorable situation due to the ports existing in the region and the navigable routes to the Ukrainian ports that are 50-60 miles away from the Romanian shore. The purpose of this paper is to present the impacts of the sulphur directive and to discuss the possibility of designating the Black Sea as an ECA.*

### 2. Impact of Covid-19 on Maritime Transport

**Author:** stud. Andreea-Alina PETRIȘOR

**Scientific Advisor:** Assoc. Prof. Filip NISTOR, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In today's increasingly globalized economy, transport plays a central and critical role as the primary enabler of the flow of freight within and across borders. With over 80% of global trade by volume and up to 70% of its value being carried on board ships and handled through seaports worldwide, maritime transport for trade and development is of great*

importance. The COVID-19 pandemic with government measures, such as coercive lockdowns, social distancing, and restriction of mobility, caught the maritime industry without any comprehensive plans in dealing with infectious disease outbreaks. Consequently, the shipping industry, was severely impacted: cruise ships, passenger ships and vehicle carriers were detected to have drops of 85.8%, 39% and 22.1% respectively. Meanwhile, the number of ships calls for bulk carriers, chemical tankers, container ships, general cargo vessels, liquified gas tankers, oil tankers, ropax and ro-ro cargo ships saw only a small decrease (up to 5%).

### **3. Environmental Risks Assessment Methodology in the Case of Marine Oil Pollution**

**Author:** stud. Georgiana-Elena ANTONIE

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** Among the threats to the internal security environment can be identified those associated with economic activities that take place in the western part of the Black Sea coast (maritime transport, exploitation of resources in the maritime economic zone, economic objectives located in the coastal area, etc.). The paper presents the structure of an environmental risk assessment methodology in case of marine oil pollution. From this perspective, the paper emphasizes the need to develop an instrument for assessing the impact of marine oil pollution in order to increase answers and intervene in order to counter the threats and ensure resilience. The paper proposes a tool to support public authorities in managing marine pollution emergencies.

**Keywords:** coastal safety, marine oil spill, methodology for oil pollution

### **4. Computer Aided Simulation in the Event of a Chemical Accident in Liquefied Gas Transport Ships**

**Author:** stud. Ţucra-Branga ASTIN

**Scientific Advisor:** Aurel TROFIN, PhD

**Institution:** "Alexandru Ioan Cuza" Academy of Police

**Abstract:** The contents of this paper simulate the negative effects of existing hazards on liquefied combustible substances carriers, in different situations, conditioned by ship types, weather conditions and geographical positioning. At the same time, the established fire protection measures and the recommendations from specialists are analyzed and based on the simulations done with the Cameo, Aloha and Marplot software, measures will be established to protect the population, the environment and last but

*not least the private, voluntary and professional personnel for emergency situations.*

## **5. Bulk Carrier Safety in Port Operation**

**Author:** stud. Tania Oana AUR

**Scientific Advisor:** Mihail PRICOP, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *A Bulk Carrier is a commercial vessel specialized in transporting bulk goods, such as: grain, coal, ore, cement, stored in special warehouses. Since the first bulk carrier ship was built in 1852. Today's ships are built specifically for safety, efficiency, and to meet stringent international standards. Terminal operators shall satisfy themselves as to the operational suitability of bulk carriers for the loading or unloading of solid bulk. Terminal operators shall ensure that, as concerns terminals for which they assume responsibilities terminal representative is appointed. Information books are prepared containing the requirements of the terminal and competent authorities and information on the port and terminal. The master has responsibility for ensuring that there is safe access to and from the ship. Generally, the ship provides the access and the master and terminal operator confirm it is safe and suitable. The master has responsibility for ensuring that there is safe access to and from the ship. Generally, the ship provides the access and the master and terminal operator confirm it is safe and suitable.*

## **6. Sustainable Development in the Port Industry**

**Author:** stud. Roxana-Cristina BĂJAN

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The future sustainable port is a concept that takes into account not only the economic sphere, but also the environmental and social sphere. The concept of "Sustainability" for ports is the integration of ecological methods of port activities, operations and management. The transition to sustainability is also a social challenge involving international and national legislation, urban planning and transport, local and individual lifestyles and ethical consumerism. The future sustainable port is a concept that takes into account not only the economic sphere, but also the environmental and social sphere. The concept of "Sustainability" for ports is the integration of ecological methods of port activities, operations and management. In other words, in a sustainable way: any development has minimal potential impacts, helping to improve air, water, noise and waste quality measures and controls.*



## **7. Time to Ignition Analysis of a Combustible Material Through a Thermal Barrier**

**Author:** stud. Alexandru-George BECHERU

**Scientific Advisors:** Răzvan CALOȚĂ, PhD, Iulian-Cristian ENE, PhD

**Institution:** "Alexandru Ioan Cuza" Academy of Police

**Abstract:** *In this paper, I conduct a study regarding a common event in the case of a fire incident, that being the ignition of combustible materials, without having direct contact with the flame, through certain thermal barriers such as a wall as a result of the heat flux transferred raising the temperature to a degree that enables objects to light aflame.*

## **8. Shipping Agency & Port Services**

**Author:** stud. Maria BURIU, stud. Andrada-Maria FODOR

**Scientific Advisor:** Assoc. Prof. Filip NISTOR, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *This paper presents analysis into shipping agency and port services which provide arrival/departure formalities, ordering berths, pilots, tugboats, clearance in/out. As well this paper involves cargo documents for a ship under operation at Constanta Port in order to discharge 2949.195 mts project cargo. These following documents are needed for the good order of operating the vessel without incurring any delays: cargo plan, cargo manifest, packing list, notice of readiness, bill of lading, statement of facts. Also, in this article below documents will be attached and described. Therefore, the paper will provide agency procedure for a vessel in operation.*

## **9. Shipping Container Terminals**

**Authors:** stud. Andreea CÎLEA, stud. Miruna-Gabriela TOFAN

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *Globalization of the world economy has seen a significant increase in container cargo with the increasing international trade for the rationalization of transportation and efficient improvement in logistics. Shipping and port industries are undergoing rapid environmental changes because of the reorganization of carrier alliances, enlargement of ships, and an increase in global uncertainty. The focus of this paper is to highlight recent developments in container terminals, which can be classified into three areas: innovative container terminal technologies, new directions of operation and models for existing research areas and emerging areas in container terminal research.*

## **10. The Environmental Impact of the Increase in Freight Traffic**

**Author:** stud. Alina FEODOT

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

***Abstract:** In the current context, the life we know would be impossible without transport. This sector of the global economy has a significant impact on the country's GDP, but unfortunately it also has a significant impact on the environment and human health. As people's needs are constantly changing, the freight transport sector needs to adapt at the same speed to consumption requirements. This work will analyze the environmental impact of increasing global freight traffic. These increases in fuel and raw material consumption can be extremely negative if efficiency measures were not taken in terms of energy consumption, because the transport sector is only one of the major consumers of resources.*

## **11. Simulation of the Electromagnetic Energy Absorption in A Human Head Model Wearing a Kevlar Helmet With 2.4 GHz Mounted Antennas**

**Authors:** stud. Florin CIUREA, stud. David VĂȚĂMANU

**Scientific Advisor:** Simona MICLĂUȘ, PhD

**Institution:** “Nicolae Bălcescu” Land Forces Academy, Sibiu

***Abstract:** Electromagnetic technologies for military applications are extensively used to satisfy a variety of operational requirements, especially battlefield communications. This is achieved by the use of electromagnetic waves in several frequency bands (VHF, UHF). In this study, two realistic military scenarios were simulated considering a highly detailed virtual human head model inside a Kevlar helmet. In order to transmit the video battlefiled signals we imagined the use of WiFi signal. The antenna emitting this signal is a 2.4 GHz patch antenna that is attached to the back or/and lateral side of the helmet. The models of antenna, head and helmet were considered in exposure scenarios solved within the CST Studio Suite 2019 simulation software. The main objective of the study is to deepen the analyses of electromagnetic exposure and dosimetry, to show the impact of radio frequency radiation absorption in human tissues. Another goal is to observe the maximum specific absorption rate of energy deposition in the human head depending on the location of the antenna on the helmet.*

## **12. Innovative Solutions for Sustainable Management of Port Logistics System Activities at a Container Terminal**

**Author:** stud. Mihaela Cristina GAVRA

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *With the rapid development of the economy and world trade, followed by the implementation of the green port concept, the automated container terminal (ACT) has become one of the main directions of development. From this perspective the paper analyses the technical structure of an ACT terminal. The paper proposes a mathematical model, based on low energy consumption, which corresponds to the operating cycle for the port machinery used, facilitating the optimal operating variant for an environmentally friendly terminal. The proposed model, for a given configuration, allows the estimation of total carbon emissions for a given period of operation.*

**Keywords:** *container terminal, automated container terminals, carbon emissions.*

### **13. Sustainable Liquefied Natural Gas Supply Chain Management: A Review of Quantitative Models**

**Author:** stud. Chira GORE

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Natural gas is an essential fuel in the transitions towards a sustainable energy future as it is considered a cleaner source of fuel when compared to other hydrocarbon sources. To enable natural gas delivery from the producer to consumers, natural gas is liquified to enhance transportation efficiency and reliability. The main contribution of this paper is to develop sustainable LNG supply chain through a review of different sustainable supply chain management tools and assessing their applicability in managing LNG supply chains. Energy security has evolved to include the protection of the entire energy supply chain and infrastructure rather than a consideration for the availability of resources alone. There is a particular focus on coupling sustainability and resilience/risk as part of the need to develop integrated approaches to manage energy supply chains to deliver cargo at minimal cost and environmental impact, and to ensure that supply chains can overcome vulnerabilities with standing potential disruptions to the supply chain. Outcomes of this review demonstrate the possibility to develop multi criteria models, which consider sustainability dimensions with in the LNG supply chains and to integrate parameters that form part of the annual delivery plan ensuring day to day LNG supply chain planning consider multiple objectives*

**Keywords:** *closed loop; forward loop; optimisation; LNG; resilience*

#### **14. Green Ports in Theory and Practice**

**Author:** stud. Dincuța-Tania GORE

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

***Abstract:** This chapter introduces the topic of green ports and establishes the background and motivation for this volume. The chapter provides an overarching view of the key elements of environmental issues in shipping, particularly from the port perspective. This is followed by a discussion of the current, emerging and potential strategies to introduce more sustainable practices, the different actors involved and also the importance and changing nature of national and international regulation. The structure of the book is introduced and a brief outline of each chapter is presented. Finally, the chapter concludes with thoughts on developing trends and the future environmental performance of the port sector.*

#### **15. Vertical Expansion: A Solution for Future Container Terminals**

**Author:** stud. Alice-Andreea GRĂDINARU

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

***Abstract:** Container terminals play a major role in the growth of international trade. They need to accommodate the increasing number of containers while their space is limited, particularly close to major cities. One approach, often used in practice, is horizontal expansion through expensive land reclamation projects. In contrast, vertical expansion uses the available land more efficiently by storing containers in high-bay warehouses. In the presentation, we analyse a next generation container terminal consisting of container storage towers. The results show that, compared to a traditional container block, the container tower can increase the annual throughput, while saving on the required footprint at competitive investment costs. In particular, the container tower can increase the annual throughput up to 120% compared to a container block of the same storage capacity.*

#### **16. Performance Measurements of Container Terminal Operations**

**Author:** stud. Adela – Gabriela IGNAT

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

***Abstract:** In the world, all ports are unique, and the task of measuring and analyzing performance is not simple and is made more difficult by the failure to establish industry standards on what to measure, how to measure it and how to express the measure in an informative and consistent manner.*

*This difficulty is compounded by the fact that there is no single measure that can sum up all the important aspects of port or terminal performance. This study aims to analyze the existing literature about performance measures of container terminal operations.*

### **17. Virtual Laboratory to Illustrate Cyber Attacks**

**Author:** stud. Alexandru IONIȚĂ

**Scientific Advisor:** Vlad VASILE, PhD

**Institution:** “Nicolae Bălcescu” Land Forces Academy, Sibiu

**Abstract:** *Information systems are currently an integral part of economic, social, professional, governmental and military infrastructure. They are needed in all areas of modern life, either as a fixed workstation or as a mobile device. Their vulnerabilities are a growing concern for cybercriminals who use our personal information for malicious purposes. The aim of this article is to create a virtual laboratory to emphasize the theoretical aspects of two types of widespread cyber attacks, as well as to put into practice two scenarios to illustrate them. The realization of these scenarios was aimed at highlighting some deficiencies in terms of computer network security. These shortcomings can be identified in many organizations due to the lack of specialized staff. The goal was also to present security mechanisms to correct the breaches identified, and thus the effects of possible attacks will be minimized or even eliminated.*

### **18. Sustainability and Environmental Management: Emissions Accounting for Ports**

**Author:** stud. Isabela - Nicoleta BAVALETA

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Seaports are global hubs for the transportation of goods. They play an important role in today’s global societies and are critical nodes in transportation networks. Sustainable energy use impacts people, the world’s environment, and is relevant to the operation and maintenance of ports. In this article, an inventory of greenhouse gas (GHG) emissions in the port of Chennai is made by accounting for the various port facilities, the housing areas, and the fishing harbour, all managed by the port of Chennai. GHG emissions are quantified by following the guidelines of the Intergovernmental Panel on Climate Change (IPCC) and the World Port Climate Initiative (WPCI). Our estimate of GHG emissions for the financial year 2014-15 indicates that 280,558 tonnes of CO<sub>2</sub>e/year were generated by the port and port related activities. The detailed estimation of energy consumption and emissions generated by the individual systems are useful*

*for energy engineers when implementing energy conservation measures and renewable energy technologies. Implementation of GHG mitigation strategies for all port-related activities will help achieve significant GHG reductions, reducing the adverse impacts of global climate change.*

## **19. The Environmental Impact of Maritime Transport**

**Author:** stud. Irina IVAȘCU

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

***Abstract:** Maritime transport has traditionally been seen as environmentally friendly and has thus avoided the strict environmental regulation of land transport. However, the situation changed rapidly after the 1990s, and in the 2010s many new environmental controls have been introduced globally. The biggest cause of local environmental impact from maritime transport are accidents. The ship might leak its own fuel or other important substances, or the tank of the ship might leak dangerous chemicals such as crude oil. On the other hand, a big share of environmental impacts related to maritime transport can be reduced by reducing other transport costs. Removing unnecessary trips, increasing the size of transport batches, and decreasing cruising speed can reduce fuel consumption and thus also pollution.*

## **20. Using the Fault Tree Analysis to Evaluate the Safety of the Shipyard Operations**

**Author:** stud. Emilia-Elena MATEI

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

***Abstract:** Investigating the causes of accidents and potential risks in a container terminal is an interesting area of research. The examination of accidents and potential risks is done using the Fault Tree Analysis (FTA). In order to reach the final conclusions, we need to elaborate on the issue of evaluating the safety of port operations in the container terminal, the methodology of risk analysis and to analyze the risk assessment. In the approach, the information used is presented by Health and Safety Executive (HSE) within Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR)/ Ports Skills and Safety Ltd. (PSS).*

## **21. Energy Crisis in Europe**

**Authors:** stud. Gabriela MAZILU, stud. Diana NEACȘU

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In the second part of 2021 prices for energy started to rise, as a result of multiple factors. To understand what caused the crisis, what measures were needed and where was standing Europe before with prices for energy, we decided to explain all of these in our article. Even If the prices were lower in 2020 during the pandemic due to lower demand of energy, the current increase is still very pronounced compared to prices in 2019. But this high demand for energy doesn't affect just people, who are paying a higher price for energy, but also the environment with additional sources to face the amount of energy requested in Europe. The energy crisis in Europe is affecting many countries and has negative consequences.*

## **22. Development of a Virtual Reality Simulation**

**Author:** stud. Corina Elena MURGEA

**Scientific Advisor:** Mihai BEJAN, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *Any large-scale cargo port requires the use of container cranes for loading of intermodal containers as well as unloading them. The operator of such a large crane must be appropriately trained to prevent any accidents at the cargo port. This should be achieved by training crane operators on all the protocols of crane operation with significant hours of practice. The aim of this project is to develop a virtual reality (VR) simulation for operator training of container cranes which are remotely controlled, situated at the cargo ports. The simulation consists of a virtual control room equipped with joysticks and display screens, container crane, container ships, trucks and a cargo port environment. We used an actual super post-Panamax quay crane as a reference model for this simulation. The project has been built using Unity3d for the programming and 3DSMAX for the designing of models. The virtual joysticks in the simulation can be interacted by using the Oculus Rift VR setup thus allowing to maneuver the crane and the container load in all three dimensions. This paper mainly discusses the structure and implementation of the virtual reality simulation for crane operator training, along with a proposal for further improvements.*

## **23. Waste Management Solutions Resulting from Port Operations**

**Author:** stud. Silviu Eugen PRUTIANU

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *A present major problem for ports is arranging adequate reception facilities for ship-generated waste, as the lack of such facilities is a problem to many shipowners. To preserve the environment in and around*

*the ports it is necessary also to deal efficiently with the port-generated waste. Although international conventions on the retention of waste on board ships for subsequent discharge to shore reception facilities have been ratified by most seafaring nations, a considerable part of the ship-generated waste still goes into the sea. Much of the waste generated in ports will also be dumped in quantities that at least affect the local marine environment. The handling of waste consists of two main phases—collection and treatment. Waste has to be collected in every port and on board every ship, whereas generally only some wastes are treated and to a certain degree in ports and on board ships. This paper considers the different kinds of waste generated in both ports and on board ships, where and how it is generated, how it could be collected and treated. The two sources are treated together to show how some ship-generated waste may be treated in port installations primarily constructed for the treatment of the port-generated waste, making integrated use of the available treatment facilities.*

#### **24. Design, Control and Applications of Modular Multilevel Converters for HVDC Transmission Systems**

**Authors:** stud. Sebastian-Aurelian SANDU, stud. Cristian-Andrei ZAHARIA

**Scientific Advisor:** Iancu CIOCIOI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *State of art power electronics plays a major role in our society and our daily life. Voltage-source converter (VSC) technologies are utilized in applications such as electric vehicles, variable-speed drives, high-voltage direct current (HVDC) transmission and flexible alternating-current transmission systems (FACTS). Nowadays, converter technologies are an integral part of all renewable power generation technologies such as wind turbine generators and photovoltaic generation units. VSC technologies are key elements for achieving enhanced system yield in power generation and power transmission.*

#### **25. The Importance of Internship in Career Development**

**Author:** stud. Ana-Maria SAVA

**Scientific Advisors:** CDR Assoc. Prof. Eng. Alexandru COTORCEA PhD, Dragoş SIMION, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *This paper presents my own vision resulting from the internship at CHIMPEX. General details about the company, facilities, values, as well as other details for which I chose to participate in this internship are exposed, the most important being the experiences related to the importance of safety,*



*risk awareness and the values I observed there. The activities carried out within the company demonstrate the way in which it has introduced technological progress in the logistics activities of grain storage, in the activities of loading and unloading ships. Real-time monitoring of the entire production flow demonstrates not only the performance in the operating activity but also the technical responsibility of the staff involved, safety and responsibility being always in the first place, each process can be tracked in real time. The most important were the people I met and who introduced me to all of this, arousing interest in knowledge and development.*

## **26. Sustainable Transport. Means of Road Transport**

**Authors:** stud. Onur SEFER, stud. Ianis ZICA

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Sustainable transport represent a complex system designed to ensure the mobility needs of current generations without damaging environmental and health factors. By streamlining energy and material consumption, it must make it possible to meet the need for mobility for future generations in optimal conditions. Sustainable means of road, especially electric cars, are a sustainable method of transport even if it pollutes more in the manufacturing process, the difference in CO2 emissions are cancelled after tens of thousands of kilometers of driving, usually in the first 5 years of use.*

## **27. Analysis of the Evacuation of a Passenger Ship By Scenario Modeling According to Imo**

**Author:** stud. Eduard Iulian ȘTEFAN

**Scientific Advisor:** Ion ANGHEL, PhD

**Institution:** Police Academy, Fire Safety Faculty

**Abstract:** *In recent years, the tourism industry has grown rapidly, as people desire more and more to escape the work-sleep cycle. A overlooked part of that industry is the cruise ship industry. According to the statistics, before the pandemic hit the tourism industry, cruise ships have seen a growth of 12 million passengers from 2009 to 2019, reaching 29.7 million per year. As the number of passengers increases, so does the number of maritime accidents, and in accordance to this the purpose of this paper is to study how efficient the evacuation of a cruise ship is. For the purpose of writing this paper, the model of reference has been a passenger ship model SGVDS2 freely provided by the FSEG-University of Greenwich, which has 11 decks, and 4 assembly points. The simulations have been modelled using the program Pathfinder created by ThunderHead Engineering. Using the modeling based*

on IMO revised guidelines on evacuation analysis for new and existing passenger ships the aim of this paper is to simulate the evacuation of a cruise ship to observe the time for passengers to reach the assembly points and to find the congestion points, considering 4 standardized scenarios.

## **28. A Quantitative Risk Analysis Approach to Port Hydrocarbon Logistics**

**Author:** stud. Olivia Nicoleta TANSAN

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** A method is presented that allows quantitative risk analysis to be performed on marine hydrocarbon terminals sited in ports. A significant gap was identified in the technical literature on QRA for the handling of hazardous materials in harbours published prior to this work. The analysis is extended to tanker navigation through port waters and loading and unloading facilities. The steps of the method are discussed, beginning with data collecting. As to accident scenario identification, an approach is proposed that takes into account minor and massive spills due to loading arm failures and tank rupture. Frequency estimation is thoroughly reviewed and a shortcut approach is proposed for frequency calculation. This allows for the two-fold possibility of a tanker colliding/grounding at/near the berth or while navigating to/from the berth. A number of probability data defining the possibility of a cargo spill after an external impact on a tanker are discussed. As to consequence and vulnerability estimates, a scheme is proposed for the use of ratios between the numbers of fatal victims, injured and evacuated people. Finally, an example application is given, based on a pilot study conducted in the Port of Barcelona, where the method was tested.

## **29. Dynamic Programming**

**Authors:** stud. Anca-Florentina VĂDUVA, stud. Denisa-Georgiana STRATULAT

**Scientific Advisor:** Dan LASCU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** Dynamic programming involves solving a problem by decomposing it into subproblems and solving them. Unlike divide-et-impera, subproblems are not disjointed, but overlap. In order to avoid the recalculation of the overlapping portions, the solution is made starting from the smallest subproblems and using their result we calculate the subproblem immediately higher. The smallest subproblems are called unitary subproblems. These can be solved in a constant complexity, e.g.: the largest

*follow-up of a set of a single element. In order not to recalculate the solutions of the subproblems that should be solved several times, on different branches, the solution of the subproblems is retained using a table (uni, bi or multidimensional matrix depending on the problem) with the result of each subproblem. This technique is called memorization.*

### **30. The Use of the Capabilities of the Ideal Design Computer in the Study of the Ship's Geometrical Shapes**

**Authors:** stud. Gabriel ZAMAN, stud. Andreea BUTNARIU

**Scientific Advisor:** Mihaela-Greti MANEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Create a tank from a 2D sketch to the 3D transformation using the AutoCAD program.*

### **31. The Evolution of the Maritime Workforce**

**Author:** stud. Alev BURMAMBET

**Scientific Advisor:** Col. Cătălin POPA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *What is the balance to be struck between owners and charterers in allocating responsibilities and costs during a serious outbreak of a highly contagious disease? This is the question which has been brought into sharp focus for the shipping industry by the Covid-19 pandemic which has affected communities around the world and impacted international trade and the day-to-day lives of seafarers. The importance of preventing crews from being exposed to serious illness and the attendant risks for owners and charterers of costs and delays to vessels are issues which need to be addressed when fixing time and voyage charter parties. The new Seafarer Workforce Report from BIMCO and the International Chamber of Shipping warns that the industry must significantly increase training and recruitment levels if it is to avoid a serious shortage in the total supply of officers by 2026. Given the growing demand for STCW certified officers, the Report predicts that there will be a need for an additional 89,510 officers by 2026 to operate the world merchant fleet. The report estimates that 1.89 million seafarers currently serve the world merchant fleet, operating over 74,000 vessels around the globe.*

**Keywords:** *workforce; shipping; world.*

### **32. Cargo Loading and Unloading Operations in Naval Transport. Case Study: Transportation of Goods in Load Units**

**Author:** stud. Alev BURMAMBET

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The aim of the study is to highlight the importance of the processes of loading and unloading of palletized goods as the initial and final link of multimodal transport by developing proposals for monitoring and evaluating the effectiveness of freight operations, as well as developing measures and comparative estimators. The analysis of the duration of handling operations during the transport process is based on the percentile rates of handling and transport in the total duration of the transport process and the percentage of handling time during transport. These indicators and the examined loading and unloading times are the basis for the development of programming algorithms for optimizing the transport processes on the scale of the entire transport chain. These data are also a useful contribution to support strategic decisions on the allocation of financial resources for the development of infrastructure and terminal equipment, warehouses and other facilities.*

**Keywords:** *loading process; unloading process; cargo handling efficiency.*

### **33. IMO- International Maritime Organization**

**Authors:** stud. Mălina-Cristina BĂLAN, stud. Carmen-Maria BORTAȘ, stud. Elena-Alina GHIORGHIU

**Scientific Advisor:** Mădălina BOTINA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The theme of the project is IMO (international maritime organization), is the specialized agency of the United Nations responsible for the safety and security of maritime transport and the prevention of marine and air pollution by ships. The IMO's work supports the UN's goals of sustainable development. IMO is one of the most important UN organizations, founded in 1948 with headquarters in London and has 175 members. The project will focus on general aspects and information about the organization. The first part of the project presents a short history and definition and later details about the structure, plans and missions of the organization will be presented. The project aims to help us understand what the organization does and its contribution in the naval field. By IMO, it has fulfilled its goals and wants to improve shipping, which in the future must be as environmentally friendly and efficient as possible.*

### **34. The Impact of the Covid-19 Pandemic on Maritime Transport**

**Authors:** stud. Iulia-Georgiana BARBU, stud. Ana-Maria BORȘ

**Scientific Advisor:** Rita AVRAM, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The purpose of this paper is to assess the impact of the coronavirus pandemic on shipping. The paper analyzes the effect of restrictions on the logistics and supply chain and their impact on freight capacity. The data of traffic and transport of bulk and containerized goods in the Port of Constanța in the years 2020 and 2021 are analyzed, compared to 2019. The solutions and measures adopted to mitigate the effects of the pandemic crisis in this sector are presented. The analysis highlights lessons and good practices that can be leveraged to prevent possible future shocks or unpleasant events that could disrupt shipping.*

### **35. Analysis of Port Performance Indicators**

**Author:** stud. Alexandra-Valentina BICA

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Integration into the global supply chain in recent decades has led to greater inter- and intra-port competition and a growing demand for integrated logistics services, and ports are becoming more than key areas that have traditionally focused solely on handling goods. Therefore, such integration allows for collaboration between port operators and the various stakeholders in the supply chain to improve reliability, predictability of delivery, time-bound performance and minimize total transport costs. Nowadays, the transition to the owner of the port government and the imposition of new models of organizational structure and ownership require the port authorities to lose their integrated role in port activity. This project will show that each port has its own characteristics and must adopt different types of indicators.*

### **36. The World’s First Autonomous Container Ship**

**Authors:** stud. Ștefania COBZARENCO, stud. Florin-Dumitru CREȚU

**Scientific Advisor:** Filip NISTOR, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The introduction of maritime autonomous surface ship to the maritime industry will open up a hole new era and bring up a new shift in terms of cost efficiency, pollution, maritime accidents and human resources. In this presentation, we will present you the world’s first fully electric and autonomous container ship with zero emission, Yara Birkeland. We will touch topics like his construction side, as well as the propulsation that is used, along side the technology that this ship is using.*

### **37. Cooperation Between Intelligent Autonomous Vehicles to Enhance Container Terminal Operations**

**Author:** stud. Corina BĂRZOIU

**Scientific Advisor:** Beazit ALI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Intelligent Autonomous Vehicles (IAVs) constitute one of the component systems of Intelligent Transportation System (ITS) that can operate in confined private spaces, as well as in open and public spaces. The seaports or container terminals are one of the important confined spaces that have attracted extensive research interests over the last decade in the use of information communication technology to improve the operation of ITS. The main goal of research works undertaken so far in this area was to improving the efficiency and cost-effectiveness of the indoor traffic, by transporting optimally and sustainably freight from ship to the logistics and unloading. areas.*

### **38. Safety in the Operation of RO-RO Ships in Port Terminals**

**Author:** stud. Bianca-Petruța DUȚU

**Scientific Advisor:** Mihail PRICOP, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The RO-RO ship is a type of specialized shipping vessel for the transport of road vehicles, container trailers, tracked vehicles, buses. Access to the ship is made on special ramps located at the bow, stern or side through large openings in the hull and provided with gates. Today, the term "RO-RO" usually refers to wheeled vehicles, cars and trucks, but the first Ro-Ro ships were actually built to carry trains. Terminal operators must be convinced of the operational suitability of the ship for the loading or unloading of goods. Terminal operators shall ensure that a representative of the terminal is appointed for the terminals for which they assume responsibility. Information books containing the requirements of the terminal and the competent authorities and information on the port and terminal shall be drawn up.*

### **39. Methods and Procedures for Handling Goods in a General Cargo Terminal**

**Author:** stud. Oana ENE

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Cargo handling processes must be analyzed from the earliest stages of ship design. They are in a very close relationship with the type of trade, with the ports of call, with the policy of the company that will*

*purchase the ship and with the economy of the trade. Until recently, the cargo was loaded and unloaded with the help of fixed beams on board the ship, and large teams of dockers worked manually to carry out operations.*

#### **40. Analysis of Accident Chains to Increase the Safety of Port Logistics Services**

**Author:** stud. Florentina IVAN

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The emergence of new types of risks associated with dangerous goods, as well as the political-military context existing at the Black Sea at the beginning of 2022, generates increasingly complex needs in the field of port logistics management of dangerous goods and calls for reflection and analysis of port activity from the perspective of accidents. In this paper, an analysis of the accidents that had a major impact, those in the ports of Tianjin (2015) and Beirut (2020), was carried out, the technical-managerial causes that facilitated their initiation being present in Romanian ports as well. The aim of this research is to highlight the constitutive elements of the accident chains that can contribute to increase the safety of port logistics services for dangerous goods operated in the port of Constanța.*

#### **41. Statistics of Transport Expectations of Bulk Shipshoer Compared to Containerized Transport for 2022**

**Author:** stud. Raluca GABOR

**Scientific Advisor:** Mihai BEJAN, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The balance of the dry and container bulk cargo Market is expected to remain stable in 2022, while shipping rates could be corrected when vaccines reduce the impact of the pandemic. Ee believe that the power of containerized global trade has had a profound impact on dry bulk shipping rates and the trading model.*

#### **42. Software for Calculus the Ship Loading**

**Authors:** stud. Adriana-Raluca IANCU, stud. Florentina-Denisa JERCAN, stud. Marian-Drăguțu VÎNĂ, stud. Dragoș-Petrișor VERZIA

**Scientific Advisor:** Mihai BEJAN, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In the naval field, the loading process is very important for the ship safety. Before each voyage, the deck officers perform a ship load calculus. At the beginning, it was a hand made calculus but, in present, evolved into a computer assisted one, using a software. The load calculus*

*involves drawing the bending moments diagram loading the ship. This is done starting from the ship loading, with merchandise, and the distributed upward forces (Archimedean pushes). Addind the above mentioned values, we obtain the resultant distributed force of the ship. By integrating it, we obtain the shear forces diagram, which, also integrated, leads to the bending moments diagram. In this paper we presented our own software for calculus the ship loading, made in MATLAB. The input data are: the length of the ship, the number of intervals the ship is divided in, the distributed and the upward forces of the ship, both for each interval. The results are the values and the diagrams of distributed and shear forces and also the bending moments of the ship.*

#### **43. The Trend of Freight Rates in Containerized Transport**

**Author:** stud. Iordana OLTEANU

**Scientific Advisor:** Filip NISTOR, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

***Abstract:** Container freight rates have a significant impacta on global trade, as over 80% of goods are shipped in containers. Freight is a major component of commercial costs, and any change in it is a challenge transport of goods. A significant percentage of the total goods transported come from China. Container freight rates in China has been the biggest challenge of recent years for all companies in the field. The cost of containerized shipping has increased seven to eight times from pre-pandemic prices. The purpose of this paper is to present and analyze the increases of the freight for containerized transport, being analyzed several routes starting from China.*

#### **44. Solutions for Optimizing the Use of Information System**

**Author:** stud. Daniel-Florin ISTUDOR

**Scientific Advisor:** Vlad VASILE, PhD

**Institution:** “Nicolae Balcescu” Land Forces Academy

***Abstract:** Computers play a very important role in today's organizations. Every company has information systems that are interconnected with each other, thus forming networks. Many organizations have two types of networks, an internal one that contains sensitive information for that company and the other one connected to the internet. Usually, a single computer can be connected to a single network, so a user must have one computer for each network. In this paper I will talk about how we can improve the user experience by putting a single computer in two different networks. This is beneficial, firstly because the user no longer has to work from two different computers, and secondly for the organization to which he*



*belongs, because it no longer has to make available to employees such a large number of computers. I achieved this by applying some security policies and through a multitude of settings and configurations brought to computers so that the two networks are as isolated as possible from each other.*

#### **45. Bulk Terminal. Analysis of the Technical-Managerial Aspects at a Port Operator**

**Author:** stud. Luminita Andreea NIȚĂ

**Scientific Advisor:** Filip NISTOR, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Aiming at the problems of lagging automation and low informationization of bulk cargo terminals, this paper has optimized the control system of bulk cargo terminals, and improved the characteristics and functions of the control system. Based on the completion of the existing remote start and stop processes and equipment, the database, fault diagnosis and information management of the bulk cargo terminal control system are optimized, which improves the control efficiency and operability of the control system. The transformation and upgrading of the control system have played a good role in promoting the development and construction of smart ports.*

#### **46. Technical and Economic Organization in the port field**

**Author:** stud. Ana-Maria Corina MARINESCU

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Initially, ports were defined as simple places where goods were loaded or unloaded downloaded. Over the years, they have evolved from the status of a simple interface between maritime and land transport (first generation ports), at the current phase of industrial and commercial agglomerations, in which a multitude of services are performed (third generation ports). Thus, we come to the notion of logistics for increasing value, which means that, in addition to the primary functions of loading or unloading, ports add value to goods. Precisely in response to this new goal, the ports are currently being arranged and developed as close as possible to the place of production and distribution of goods over as long a territory as possible.*

#### **47. Challenges to the Development of Maritime Trade**

**Authors:** stud. Anamaria MIHOC, stud. Florina GHEONEA, stud. ISABELA Mihaela HANU

**Scientific Advisor:** Rita AVRAM, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The aim of this paper is to analyze the challenges facing maritime trade in the context of economic globalization in general and the recent problems caused by the COVID-19 pandemic and the war in Ukraine in particular. The world economy has undergone profound changes in the last century. These changes have affected the volume, pattern and composition of maritime trade. The paper will analyze the main factors for the future development of maritime trade, but also additional factors such as technological change, sustainable development and regionalization of trade. It concludes that the main challenges for the development of maritime trade are the advancement of digital technologies, the shift of production near consumption centers, but also the high demand for liquefied natural gas, which seems to replace the two major goods transported by sea until 50 years ago: crude oil and coal.*

#### **48. Efficient Cargo Stowage Processes**

**Authors:** stud. Andrei-Leonard MORARU, stud. Daniela Bianca SIRBU

**Scientific Advisor:** Filip NISTOR, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Cargo stowage can be described as the process of accommodating cargo into a transport unit or a vehicle so that it will arrive to the destination in a safe and timely manner. In cargo stowage processes, the benefits digital tools and solutions can provide are plenty and not confined to vessels alone. Rather, the benefits spread across the value and supply chains. This is because ports, ships and other links of the supply chain are increasingly integrated in multi-modal data platforms which enhance efficiency in stowage processes as well as in voyage planning and execution.*

#### **49. Planning and Carrying Out Cargo Loading and Unloading Operations for a General Cargo Ship**

**Author:** stud. Mihaela NECULAI

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Starting from the title of topic, the paper will contain information about the naval transport, mentioning the types of ships used, will be mentioned aspects regarding the evolution of the transport, installations and equipment that are used to carry out the operations. And the last but not least, statistics on the transport of general goods will be presented.*

## **50. Renewable Energy Sources: The Alternative for Energy Crisis**

**Author:** stud. Roxana-Mariana ONIȘOR

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Logistics can be defined as the process by which the transfer and storage of materials, components and finished products of suppliers is managed in a strategic way, crossing the company until the products reach the consumers. This paper will present the route of transport of goods, the necessary costs, as well as the influence of the short supply chain on this journey.*

## **51. Renewable Energy Sources: The Alternative for Energy Crisis**

**Authors:** stud. Isabelle-Andreea STANCIU, stud. Elena Bianca ȘERBAN

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Renewable energy sources are energies that come from sources that either regenerate themselves in a short time or are virtually inexhaustible sources. The forms of energy are, technically, exploitable and can be used to generate electricity, produce hot water, etc. Renewable energy could provide a solution to a major problem facing the modern world: reducing environmental pollution, which is deteriorating the quality of life on Earth and harming human health. Renewable energy is unlimited and is part of the sustainable development of populated areas. Green energy can also be cheaper than traditional energy.*

## **52. Use of Alternative Fuels in the Water Transport Logistics Chain**

**Author:** stud. Oana Maria VERA

**Scientific Advisor:** Florin NICOLAE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *This paper describes the types of unconventional fuels, the storage and refueling systems with such fuels, the fuel economy and the harmful emissions from ships. That being said, we are looking for an alternative to a deficient oil fuel that simultaneously meets the requirement of limiting or eliminating polluting products. In order to replace the conventional fuel - petrol and diesel - we are looking for fuels that come from sources with high availability or unlimited availability. The fuels currently used by internal combustion engines, gasoline and diesel, have many disadvantages. The most important are pollution and limited resources. Alternatives have been sought to overcome these disadvantages. Another direction was to find alternative fuels in parallel with improving the internal combustion engine. In this way, spectacular performance has been achieved in the direction of*

*reducing the pollutant emissions generated by maritime traffic. The main alternative fuels are compressed or liquefied natural gas, liquefied petroleum gas, ethanol, biodiesel, cold pressed vegetable oil. The last three fuels are obtained by processing plant mass or various types of waste. These fuels can be used as such in specially built internal combustion engines or in a mixture with conventional fuels, in various proportions, in conventional internal combustion engines.*

### III. SECTION: MILITARY SCIENCES AND INFORMATION

#### Section Committee:

##### Chairman:

Prof. Ion CHIORCEA, PhD

##### Members:

Assoc. Prof. Delia Natalia LUNGU, PhD

LTJ Silviu POPA

Room LI126

#### 1. The Role of the English Language in the Military Environment

**Authors:** stud. Andrea ROTONDO, stud. Eduard-Cristian TĂLĂU

**Scientific Advisor:** Alina NEGOESCU, PhD

**Institution:** "Nicolae Bălcescu" Land Forces Academy Sibiu

**Abstract:** *This paper discusses the role of English as a Foreign Language (EFL) in educating military personnel, and studies its importance in the military environment, as well as focusing on the development of the English Language as a global military lingua franca. Furthermore, it is well-known that the ability to work together is now more important than ever for NATO, and all states need to share a common set of standards, especially among military forces, in order to carry out multinational operations. Multinational command structures highly require robust military personnel with a good level of English language. The English language is also required in exchanging experience among countries that are opened to share and expand their knowledge; to this end, Emilyo, the military Erasmus, has been created.*

#### 2. Military Robots in Engineer Reconnaissance

**Authors:** stud. Kacper OSIKA, stud. Tomasz BANACHEWICZ

**Scientific Advisor:** Monika WYSOCKA, PhD

**Institution:** Polish Naval Academy, Poland

**Abstract:** *The paper deals with the use of military robots regarding engineer reconnaissance. The article characterises types of military robots based on the environment in which they perform their tasks, this include Unmanned Aerial, Ground and Marine Systems or Vehicles. The paper also describes the key benefits of using robots for reconnaissance instead of soldiers. The article then presents the principles of designing a modern unmanned system, using the example of a small reconnaissance robot, which is intended to*

*assess the dangerous situations (e.g. IED, hostage situations) occurring in an enclosed space such as an urban environment.*

### **3. Analysis of Crew Management in Eastern and Western Block Fighter Jets**

**Author:** stud. Cristian-Daniel PELLE

**Scientific Advisor:** Vasile PRISACARIU, PhD

**Institution:** Academia Forțelor Aeriene “Henri Coandă” Brașov

**Abstract:** *The Cold War saw the development of two major super-powers that each sought to outdo the other in all aspects that concerned defence technology. Often times their approaches were completely different in solving essentially similar gaps within their defense arsenal. This paper will compare and contrast crew resource management for the latter period of the Cold War and outline the two different schools of thought that developed by the two giants. There will be a case study that includes the assessment of the implementation of those concepts in two air superiority jets: The General Dynamics F-16 Fighting Falcon and the Mikoyan Gurevich MiG-29.*

### **4. Legal Coordinates of Combating Fake News as Part of the Hybrid War**

**Author:** stud. Denisa-Alexandra VLAD

**Scientific Advisor:** Andreea CÎRCIUMARU, PhD

**Institution:** Police Academy “Alexandru Ioan Cuza” Bucharest

**Abstract:** *The main objective of this article is to observe and analyze the importance of combating the phenomenon of fake news as part of the hybrid war, a topic that covers both a current note and the need for more effective communication and a scientific-tactical note, namely conflict monitoring. The study begins by clarifying the notion of hybrid warfare and the concepts of the informational, correlative, and interdependent reality of news-fake news. Approaching these elements as a whole, we will continue by deciphering the legal limits of state intervention on the freedom of information flow, both from a national and European perspective, in terms of consolidation, disposition, destabilization of military forces, but especially software power, such as addictions, sanctions, propaganda and last but not least misinformation and influence.*

### **5. Electronic Warfare at the Turn of the Century XXI**

**Author:** stud. Adelina CRĂCIUN

**Scientific Advisor:** Igor ZAVALSKI, PhD

**Institution:** “Alexandru cel Bun” Military Academy of the Armed Forces, Republic of Moldova

**Abstract:** *The article contains an analysis of the problems related to electronic warfare. The authors analyze the essence and components of electronic warfare. The structures for electronic warfare are described. Based on the factual material of the recent conflicts, an attempt is made to outline the development trends of electronic warfare.*

**Keywords:** *electronic warfare, electronic warfare subunits, war development trends.*

## **6. Data Breach**

**Author:** stud. Alexandru Ștefan BEREA

**Scientific Advisor:** Florin POSTOLACHE, PhD

**Institution:** „Mircea cel Bătrân” Naval Academy, Constanta

**Abstract:** *A data breach occurs when sensitive information is exposed to unauthorized persons, either intentionally or inadvertently. Data has become one of the most important aspects of a business in the digital age. Organizations face considerable risks from data leaking, including significant reputational harm and financial losses. Data loss detection and prevention has become one of the most serious security challenges for businesses as the volume of data grows exponentially and data breaches occur more frequently than ever before. Despite a variety of research initiatives aimed at preventing the leakage of sensitive information, it remains an active research subject. This study provides information on business data breach dangers, current data leak instances, different state-of-the-art prevention and detection approaches, new difficulties, and prospective solutions for interested readers.*

## **7. Using Sociometric Analysis Applied in the Field of Social Networks to Support the Selection Phase of the HUMINT Process**

**Authors:** stud. Andrei ANGHEL, stud. Alexandra-Maria ANGHEL

**Scientific Advisor:** Răzvan GRIGORAȘ, PhD

**Institution:** “Mihai Viteazul” National Intelligence Academy

**Abstract:** *The imperative of well-founded decision making in the HUMINT-specific selection process is driving current efforts to refine, strengthen and expand the toolkit being used. The present paper aims to test the viability of adapting some interdisciplinary methods present in contemporary social sciences, originally subsumed to graph theory, to the defining particularities of HUMINT. By adjusting some elements of sociometric analysis derived from the discrete mathematical structures and subsequently exploited in computer science - social network analysis through graphs - we will prove*

*the cost-effectiveness of applying some of the components of the field in the process of human source selection. The research direction is simultaneously related both to modeling and simulation in intelligence, a subfield to which it is tributary from the angle of the framework problem, and to the sociometric approaches currently at work in social network analysis. Following the trinomial delineation of the generic conceptual background and, successively, of the methodology used, the working hypothesis will be tested by implementing it in a local historical case, documented and relevant from the HUMINT perspective, through a software application dedicated to the exploitation of graph data structures. The research aims to argue the statistical efficiency of the HUMINT decisions adopted in the selected case study, in parallel with stimulating the in-depth study and exploitation of sociometric analysis methods in the work with secret human sources.*

**Key-words:** modeling and simulation, intelligence, HUMINT, recruitment, selection, social network analysis

## **8. Cyber Security and Potential Threats to Military Operations**

**Authors:** stud. Bogdan Mihai MUREȘAN, stud. Noemi Anna RADULY

**Scientific Advisor:** Claudia Georgeta CÂRSTEA, PhD

**Institution:**” Henri Coandă” Air Force Academy, Brașov

**Abstract:** *The 21st century has brought another kind of warfare, a warfare that is fought without guns or bombs. One of the biggest threats we face today may be a rogue actor with a laptop and a desire to wreak havoc. Cyberwarfare is probably the greatest challenge that we have to face. It is deeply concerning to think of the damage that a successful cyberattack can make. This is going to be the new battlefield, an unseen and invisible one, where teams of computer specialist from different parts of the world will duel. This report seeks to answer questions related to the effects of cyber power on military operations and the threats related to security.*

## **9. Introduction to Tactical Combat Casualty Care**

**Author:** stud. Alina BUMBĂCARU

**Scientific Advisor:** Daniel VIDA, PhD

**Institution:** Institute of Military Medicine

**Abstract:** *Tactical Combat Casualty Care is now the accepted battlefield prehospital standard of care that is reviewed and approved by the Committee on Tactical Combat Casualty Care. Tactical and environmental factors have profound impact on trauma care rendered on battlefield, as good medicine can be bad tactics. The purpose of this paper is to bring awareness on the importance of knowing the basics of trauma care on the battlefield and to*



*teach about the most important aspect of trauma on the battlefield which is immediate bleeding control. Up to 28% of combat deaths today are potentially preventable. Also, 85% of these deaths on the battlefield are caused by hemorrhage. Good battlefield care is paramount in avoiding preventable deaths.*

#### **10. The Middle East Between Islam (radical Islam), Oil, Civil Wars Caused by The Arab Spring and The Interests of the Great Powers (USA, Russia, China)**

**Authors:** stud. Alexia BURSUC, stud. Denisa-Georgiana VOICU

**Scientific Advisor:** Mihai SOFONEA, PhD

**Institution:** Academia Națională de Informații „Mihai Viteazul”

*Abstract: The proposed theme is of particular global importance for 2022. The Middle East has always been an area of interest to the great powers and beyond. It has been targeted over time by several attempts, whether natural – earthquakes, tsunami or artificial – religious, political, civil/armed conflicts, interests in natural fields. We believe that the subject is extremely interesting, which must be dealt with from every perspective.*

#### **11. Diving Technology in the Context of Modern Warfare**

**Author:** stud. Vlad CONTESI

**Scientific Advisor:** Daniel VIDA, PhD

**Institution:** Institute of Military Medicine

*Abstract: As the importance of maintaining stable supply chains starts to become apparent in today's interconnected world different nations from around the globe start to invest their war budgets into pushing further the limits of technology and of human capability in order to make sure that tomorrow's war doesn't catch them off-guard. In this article we are exploring different means by which military personnel around the globe employs technology and science to conquer the depths of our oceans and seas in order to achieve tactical advantages. As 21<sup>st</sup> century war starts to unveil its face it becomes obvious that sabotage and the employment of special operations forces behind enemy lines will be two of the most important forces that will shape future conflict and we should be ready for that.*

#### **12. Equipment Military Stationed on the Territory of the Republic of Moldova-Danger to State Security**

**Author:** stud. Ecaterina PIȚENTI

**Scientific Advisor:** Alexandru TANASIEV, PhD

**Institution:** “Alexandru cel Bun” Military Academy of the Armed Forces, Republic of Moldova

**Abstract:** *The Ministry of Defense is the specialized central public authority, which organizes, coordinates and leads the activities in the field of national defense and is responsible for the construction and development of the National Army and its preparation for the execution of the country's defense missions having also the attribution for the endowment with weapons, technique and technical-material resources in the necessary volume. Regardless of the type or place where they are located, weapons depots are objectives of special importance and therefore measures are required to raise the level of security and safety. National stockpiles of weapons and ammunition may also pose risks to national security, the military and public safety. Insufficient evidence and inadequate physical security of storage facilities can facilitate the diversion of ammunition and weapons from the national stock to terrorists, criminals and other insurgent groups, increasing insecurity and instability. In addition, damage to ammunition components can contribute to unplanned explosions at ammunition sites, which can have significant negative socio-economic and political consequences for the country.*

### **13. Cryptography-A World of Illusions**

**Author:** stud. Gabriel Marian LEIZERIUC

**Scientific Advisor:** Florin POSTOLACHE, PhD

**Institution:** „Mircea cel Bătrân” Naval Academy, Constanta

**Abstract:** *„When cryptography is outlawed, bayl bhgynjif jvyy unir cevinpl.” (John Perry Barlow) Cryptography, a branch of mathematics that deals with securing information as well as authenticating and restricting access to a computer system, is for sure a world of illusions, appearances and secret codes. Both mathematical methods and quantum encryption methods are used in their realization. Every single secret is known by at least one person, so explaining how cryptography was invented, updated and also how it is used nowadays, a list of the current uses, presenting this world of illusions. Each message we see on the TV, in emails or on social media like Twitter or Meta can be a cover of another message.*

### **14. Diving Technology in the Context of Modern Warfare**

**Author:** stud. Ana Marina GEORGESCU

**Scientific Advisor:** Daniel VIDA, PhD

**Institution:** Institute of Military Medicine

**Abstract:** *As the importance of maintaining stable supply chains starts to become apparent in today's interconnected world different nations from*

*around the globe start to invest their war budgets into pushing further the limits of technology and of human capability in order to make sure that tomorrow's war doesn't catch them off-guard. In this article we are exploring different means by which military personnel around the globe employs technology and science to conquer the depths of our oceans and seas in order to achieve tactical advantages. As 21<sup>st</sup> century war starts to unveil its face it becomes obvious that sabotage and the employment of special operations forces behind enemy lines will be two of the most important forces that will shape future conflict and we should be ready for that.*

### **15. NATO'S Cyber Defense**

**Author:** stud. Ionela-Andreea MARIȘ

**Scientific Advisor:** Claudia Georgeta CÂRSTEA, PhD

**Institution:**” Henri Coandă” Air Force Academy, Brașov

**Abstract:** *Cyber security threats have become increasingly serious in last years. They are not limited by borders and show an increase in frequency and sophistication. The universal affiliation of cyberspace, the security risks posed by cyber attacks and the potential global nature of their effects call for international cooperation efforts to ensure the security of information systems. Cyber defense is part of one of NATO's core tasks, collective defense. NATO's primary responsibility in this area is to defend its own networks, including those used in operations and missions, and to support increased Allied resilience to protect national networks.*

### **16. On the Psychological Warfare in Afghanistan and Its Impact on Romania**

**Author:** stud. Dana-Maria LATU

**Scientific Advisor:** Ileana CHERSAN, PhD

**Institution:** Police Academy “Alexandru Ioan Cuza”

**Abstract:** *The twentieth century is considered to be the most destructive in human history, but the third millennium is facing the threat of terrorism. Today, despite all the technology and equipment that exists and keeps being developed, the world and social interactions still play an essential role, especially in military operations. As a result, psychological warfare is a relevant branch of military operations, as it requires being both physically and mentally fit. They are usually the support team that develops and disseminates the influential message to influence behaviours, values, beliefs to attain the mission objectives. A mission where psychological operations played a relevant position is the International Security Assistance Force (ISAF), mandated by the United Nations aimed to help strengthen the*

*Afghan national security forces and the Afghan government. Given the cultural, social and economic condition of this country, the approach the NATO forces had toward the local population had a significant impact on the outcome. Therefore, the aim of this paper is to analyse the concept of psychological warfare, illustrated with examples from the Afghanistan case study. Also, I will also consider the effects that Romania's participation in these operations had on its position in the international community.*

### **17. NATO and the Current Global Security Issues**

**Authors:** stud. Monika-Roberta BĂRBIERIU, stud. Marko Andreas BALOGH

**Scientific Advisor:** Cătălin TECUCIANU, PhD

**Institution:** „Mihai Viteazul” National Intelligence Academy

*Abstract: In the presentation, we set out to conduct through a research into the global security issues that include NATO in the context of rivalry between USA, China and Russia, especially the relationship between the two great world powers – Russia and China with the United States and its allies. We will present the current situation, but also some future prospects of NATO on the rivalry between the three great powers and their different perspectives on the situation. We intend to talk about these three powers military strategies and how they make use of informational power and their importance in the current situations.*

### **18. Communication Abilities Specific to Officer Profile**

**Author:** stud. Teodora NUȚĂ

**Scientific Advisor:** Cosmina NECULCEA, PhD

**Institution:** “Henri Coandă” Air Force Academy, Brasov

*Abstract: Every human being's existence depends on communication, whether it refers to the social interaction or to inner speech. It is fundamental to the existence of an organization, notably for military grouping and its continuous and productive evolution. A military officer, auxiliary to his tactical and strategic training, develops a psychological and communicational profile that allows him to efficiently interact with subordinates and superiors, as well as to communicate with his counterparts in other states. The main purpose of this presentation is to highlight the importance of communication skills from a military perspective, but also to emphasize the methods that should be used in perfecting these abilities. Furthermore, it provides an analysis of communication competences specific to officers, including speech techniques, gestures and body language.*

## **19. Prisoners of War and Their Role in State Security**

**Authors:** stud. Diana BULARCA, stud. Maria Mădălina MARTIN

**Scientific Advisor:** Cosmina NECULCEA, PhD

**Institution:** "Henri Coandă" Air Force Academy, Brasov

**Abstract:** *When speaking about war and its consequences, a main element is represented by the effects manifested on people, whether they are military personnel or civilians. The most encountered problem associated with people involved without their will is defined by the prisoners of war (POW). A prisoner of war is any person that is taken as a hostage in the context of an armed conflict between two belligerents. Usually, they are held captive with the purpose of one's country, state or actor in blackmailing his opponent and gaining advantages. This paperwork is meant to illustrate specific situations with different types of prisoners of war, their rights but most importantly, their responsibilities and obligations regarding the security of their home state, which are all provided by international laws and organizations and must be brought to light on a wide scale in the society.*

## **20. Stuxnet**

**Author:** stud. Gabriel STORISTIANU

**Scientific Advisor:** Florin POSTOLACHE, PhD

**Institution:** „Mircea cel Bătrân” Naval Academy, Constanta

**Abstract:** *Stuxnet is a malware of such sophistication that it is most likely the work of one or more nations. It has probably destroyed about 1.000 centrifuges and delayed Iran's nuclear weapons program, but it has probably not had as much impact as its creators had hoped.*

## **21. The Nuclear Threat**

**Author:** stud. Gabriela TIRON

**Scientific Advisor:** Sabin GUȚAN, PhD

**Institution:** "Nicolae Balcescu" Land Forces Academy, Sibiu

**Abstract:** *Until the present, nuclear weapons are the most important vector of power from a military instrument perspective. The few countries that own this type of weapon have gained so-called "military supremacy" in the system of international relations. The use of nuclear weapons has been done only once in human history, and the events in Hiroshima and Nagasaki have sufficiently demonstrated the destructive capacity of nuclear weapons. Although nuclear weapons have not been used for more than half a century, states continue to develop programs to equip or modernize this type of weapon. However, the main role of nuclear weapons is only to deter. Thus,*

states appeal or may rely on their nuclear capabilities in order to discourage other state actors.

## **22. ASW. Searching and Detection of Enemy Submarines in a Specific Naval Area**

**Authors:** stud. Valerică STÎNGĂ, stud. Alexandru-Vlăduț SAVA

**Scientific Advisor:** Lecturer Viorel COSTACHE, PhD

**Institution:** „Mircea cel Bătrân” Naval Academy, Constanta

**Abstract:** *This paper aims to highlight aspects of the Anti-Submarine Warfare (ASW), from theoretical ones to tactical methods used in practice. Namely, that include the type of forces used, means, and arms for each one, the principal accent being on searching and detection of submarines, who can be a real threat in the naval area of the state and beyond, in which those can execute illegal military actions. Finally, the presentation ends with the proposal for a much better search method, in terms of reducing the attrition level of the ships and fuel consumption.*

## **23. Offensive Counterair Operations Against Enemy Air Forces – Their Role and Influence Over the Outcome of Armed Conflict**

**Author:** stud. Alin-Claudiu FUSARU

**Scientific Advisor:** Vasile BUCINSCHI, PhD

**Institution:** “Henri Coandă” Air Force Academy

**Abstract:** *In order to present the influence and the role of offensive counterair operations against enemy Air Forces in the development and outcome of the armed conflict, I will define and divide counterair operations within two categories, with emphasis on our topic of interest, the offensive ones. I will also discuss goals, execution, choosing targets and the objectives of the offensive counterair operations. Last but not least, I will highlight the influence of this type of operation during an armed conflict or even a war. In order to fully understand the importance of these operations, I will also talk about the levels of control of the air and the importance of maintaining air supremacy. Both the scientific ideas and my personal opinions will be supported by appropriate pictures, figures and diagrams. Also, understanding the use of these types of operations helps us, the future officers, to prepare and develop the missions in the most efficient way and to create an interoperability between the different types of forces.*

## IV. SECTION: ELECTRICAL ENGINEERING

### Section Committee:

#### Chairman:

Lecturer Eng. Iancu CIOCIOI, PhD

#### Members:

Lecturer Eduard DRAGOMIR, PhD

Lecturer Eng. Leon PANĂ, PhD

Assoc. Prof. Alina BALAGIU, PhD

Room LI356

### 1. Three-Phase Rectifier

**Author:** stud. George-Robert ALEXANDRU

**Scientific Advisors:** Vasile DOBREF, PhD, Asist. univ. Vlad MOCANU

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *I will present at the scientific communication session the working and implementation of a three-phase rectifier. At the start, a brief and concise introduction of rectifiers and three phase rectifiers is provided along with its types. After that proper implementation of three phase rectifiers it will be a presentation on a MATLAB's simulink.*

### 2. Grid-connected Photovoltaic Systems

**Author:** stud. Ionut BELENCHI

**Scientific Advisor:** Florențiu DELIU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The photovoltaic energy as one type of renewable energy has attracted in the past decade a great interest due to its free availability, to its ease of use relatively to other electricity resources, and its “green” operation on the entire earth planet. So, it is necessary to highlight its operation, its use, its evolution, its advantages, and furthermore its capability to solve several problems on the electric grid. The advances in this field of electrical engineering are great till now and keep discovering new contributions which are illuminating the future plan of this industry. On the other hand, the photovoltaic energy as an additional source on the grid requires studying its behavior under specific circumstances like electric faults, islanding operation, and so on.*

### **3. All Electric and Hybrid Electric Propulsion Technology for Small Vessels**

**Author:** stud. Ionuț BELENCHI

**Scientific Advisor:** Florențiu DELIU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Electrified vehicles, including hybrid electric vehicles and pure electric vehicles, have shown substantial improvements of energy efficiency, emission reduction, and possible life-cycle cost saving over conventional vehicles solely powered by internal combustion engines. Progress on electrification of marine vessels has been made; however, the pace has been impacted by the different operational requirements of each type of vessel, relatively small batch of production, longer or varied lifetime, and complex design optimizations of the vessels' electric propulsion system and energy storage system. Series hybrid electric and pure electric powertrain system designs with powertrain component models and rule-based system control, including properly sized electric ESS with supercapacitor (SC) or battery, have been studied*

### **4. The Future of Hybrid Motors through Possible Improvements**

**Authors:** stud. Nicolae CARACOSTEA, stud. Elena-Cristina TAIFAS

**Scientific Advisor:** Gheorghe SAMOILESCU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *This paper includes research over hybrid motors, their importance in the outcoming future and capabilities through mechanical and electrical engineering. Firstly, a short introduction about the world's inclination for the actual types of engines will be made. Secondly, the potential of the hybrid engines and why is it a matter of interest for us over other types of motors, electromechanical engineers will be pointed out. Thirdly, this paper will go beyond the theoretical part of it and will mention possible improvements that can make hybrid motors more proficient. Finally, the presentation will be centered on the future of hybrid motors through the improvements that were discussed, and if they will still be a matter of interest over time.*

### **5. On the Maintenance of Marine Electrical Generators Using Vibration Analysis**

**Author:** stud. George Alexandru CIUMETTI

**Scientific Advisor:** Senior Lecturer Tiberiu PAZARA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The use of vibration analysis to determine the technical condition of an installation is a commonly method used by specialists. This paper*



*investigates the sources of vibration in marine electrical generators and presents the importance of vibration measurement data for the maintenance of these generators.*

## **6. On the Maintenance of Marine Electric Motors Using Noise Analysis**

**Authors:** stud. Cristian Adrian DINU, stud. Veniamin VIDINEI

**Scientific Advisor:** Lecturer Tiberiu PAZARA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Marine electric motors are sources of vibration and noise. Maintenance of these motors can be carried out invasively (e.g. by defectscopy) which means disassembly of the motor or it can be carried out non-invasively (e.g. vibration measurements, noise measurements). In this paper, the advantages of marine electric motors maintenance using noise analysis of the motors are presented.*

## **7. Exif Metadata Viewer and Removal Tools**

**Author:** stud. Valentin-Ionut DUMITRA

**Scientific Advisor:** Vlad VASILE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Exchangeable Image File Format (EXIF) is a standard that defines specific information related to an image or other media captured by a digital camera. It is capable of storing important data as camera exposure, date/time the image was captured, and even GPS location. This raises the issue of some security vulnerabilities for our personal data, because we upload daily, on the internet, photos that we take with our smartphones. Most people don't understand what goes behind every social platform or web site, and everytime we upload an image, we need to understand that we give all of our personal data away for free. We can't be sure what the owners of the platforms that we use could do with it, but if we know a thing, it's that they probably collect all this data from us. I've implemented an application that allows us to test and see, on our images, what kind of data hides behind them and what we give away to strangers by uploading them. As a solution for this problem we could run another tool, wrote in python, to remove those EXIF metadata from our images before uploading them.*

## **8. Study of a Hybrid Naval Power System**

**Author:** stud. Silviu ENE

**Scientific Advisor:** Florențiu DELIU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Marine transport has been essential for international trade. Concern for its environmental impact was growing among regulators, classification societies, ship operators, ship owners, and other stakeholders. By applying life cycle assessment, this article aimed to assess the impact of a hybrid system (i.e. an electric power system which incorporated batteries and photovoltaic systems) designed for cargo ships.*

## **9. Renewable Energy Sources**

**Author:** stud. Silviu ENE

**Scientific Advisor:** Florențiu DELIU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Renewable Energy Sources (RES), used to produce energy from natural processes, are nowadays used to meet the ever-increasing energy requirements worldwide, replacing conventional energy sources. Conventional energy sources are finite and under depletion. On contrary, renewable energy sources are constantly appearing in the natural environment. The main forms of RES are solar energy, wind energy, hydroelectric energy, geothermal energy and biomass*

## **10. An Overview of Ballast Water Treatment**

**Author:** stud. Leonard IANUȘ

**Scientific Advisor:** CDR Assoc. Prof. Eng. Alexandru COTORCEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Container transport, although affected by the Covid 19 crisis, continues to be very important in global freight logistics. In addition to the important benefits, container vessels have an impact on the environment, in terms of greenhouse gas emissions, but also in terms of multiple effects on water. This paper addresses the impact of ballast water, given the importance of its treatment. Outlines of IMO regulations and strategies for the operation of ballast plants, as well as the main modern methods of water treatment, are briefly presented.*

## **11. The Power Plant of a Coast Guard Ship**

**Authors:** stud. George-Cosmin MITU, stud. Akkan ALI

**Scientific Advisor:** Florențiu DELIU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The naval power system (NPS) comprises all electrical installations and equipment on board the ship intended for the production, conversion and distribution of electricity intended for the supply of electricity to consumers on board the ship. The NPS structure contains: electricity sources, electricity transmission lines, distribution panels and*

*electricity converters. Electricity consumers are not part of the NPS, they have specific peculiarities and are treated separately. On ships, as sources of electricity, DC and AC generators driven by diesel engines or turbines as well as accumulator batteries are used. Power transmission lines are carried out with electrical cables or conductive bars. Distribution boards are constructions designed to connect electricity transmission lines with a view to distributing it to more than one consumer.*

## **12. The Role of Gyroscopes in Stabilizing Ships**

**Author:** stud. Răzvan Marius MUNTEANU

**Scientific Advisor:** Eduard DRAGOMIR, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Ship stabilizing gyroscopes are a technology developed in the 19th century and early 20th century and used to stabilize roll motions in ocean-going ships. It lost favor in this application to hydrodynamic roll stabilizer fins because of reduced cost and weight. However, since the 1990s, there is renewed interest in the device for low-speed roll stabilization of vessels (Seakeeper, Quick MC2, etc.). Unlike traditional fins, the gyroscope does not rely on the forward speed of the ship to generate a roll stabilizing moment and therefore can stabilize motor yachts while at anchor. However, the latest generation of "zero speed" fins stabilizers (CMC, Humphree, etc.) can stabilize yachts while at anchor thanks to their eccentricity with respect of the shaft.*

## **13. Use of the AZIPOD Propulsion System on the Shipboard**

**Author:** stud. Cosmin-Silviu NEGREANU

**Scientific Advisor:** Eduard DRAGOMIR, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The importance of using the AZIPOD propulsion system on board ships is given by the occupied space of the components used in the installation, the low level of noise in operation, the low fuel consumption, the main disadvantage being the high investment cost.*

## **14. Study of Naval Electric Propulsion**

**Authors:** stud. Andreea-Alina OPREA, stud. Adrian Nicolae PASCU

**Scientific Advisor:** Silviu Nicolae POPA

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The main element of this paper work is electric propulsion, applied in the maritime industry. Around 80% of the world's transport is carried out using maritime transport. Although there are still different types of craft (whether surface drones or vessels with a fairly high displacement)*

*that use frames or sails to move, most modern vessels are driven by mechanical systems that are composed of a thermal engine that spins a propeller. Nowadays, one of the biggest problems in the world is environmental pollution. The authors of this paper intend to study and analyze the reliability of use as the main propulsion system on board electric propulsion. It is important that the raw material, i.e. the electricity used for the propulsion of crafts, is produced using renewable energy resources (wind energy, solar energy, hydropower, etc.). In this paper the authors deal only with electric propulsion and not energy production, and this will be a future research theme.*

### **15. On the Maintenance of a Wind Turbine Electrical Generator Using Vibration Analysis**

**Authors:** stud. Alexandru PAVĂL, stud. Răzvan Ștefan STOICA

**Scientific Advisor:** Lecturer Tiberiu PAZARA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: Maintenance of wind turbines is necessary to keep the efficiency of power generation and to avoid breakdowns. The turbine propeller is subject to wind whose intensity and direction can vary widely and rapidly. These changes create vibrations that are transmitted from the propeller to the rest of the structure. This paper discusses the link between the vibrations transmitted to the turbine generator and the use of this data in generator maintenance.*

### **16. Communicating Using I2C with Arduino**

**Authors:** stud. David POPA, stud. Sebastian Aurelian SANDU

**Scientific Advisor:** Iancu CIOCIOI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: The I2C protocol involves using two lines to send and receive data: a serial clock pin (SCL) that the Arduino Controller board pulses at a regular interval, and a serial data pin (SDA) over which data is sent between the two devices.*

### **17. A Comparison of RISC and CISC Architectures**

**Authors:** stud. Răzvan-Marian PIELE, stud. Vlad-Alexandru PIELE

**Scientific Advisor:** Iancu CIOCIOI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: Both CISC and RISC architectures continue to be widely used. RISC processors are present in most embedded devices, while x86 is the most popular architecture for desktops. Since modern processors have to*

*address both power consumption and performance, it is important to compare these architectures to support future project decisions.*

## **18. Comparative Study of Encryption Algorithms**

**Author:** stud. Ana-Maria SITARU

**Scientific Advisor:** Vlad VASILE, PhD

**Institution:** “Nicolae Balcescu” Land Forces Academy

**Abstract:** *Encryption is a method of protecting data and communications by applying cryptographic algorithms, ensuring that only authorized persons have access to information. It can be achieved using two types of algorithms: symmetric and asymmetric. In this paper I have made a comparative study between different algorithms. Initially, I analyzed the differences between symmetric and asymmetric encryption and then I compared the algorithms from these two categories. I highlighted for each algorithm, the key length, processing speed, range of use and security level in order to observe both differences and similarities. Finally, to exemplify the actual comparison, I used the Cryptool 2 software to encrypt files of different sizes with two symmetric algorithms- Blowfish and Advanced Encryption Standard, thus observing the implementation within the program and the processing speeds of the algorithms.*

## **19. On the Maintenance of Marine Electrical Generators Using Noise Analysis**

**Author:** stud. Teodor Andrei STAICU

**Scientific Advisor:** Lecturer Tiberiu PAZARA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The use of noise analysis to determine the technical condition of an installation is a commonly method used by specialists. This paper investigates the sources of noise in marine electrical generators and presents the importance of noise measurement data for the maintenance of these generators.*

## **20. On the Maintenance of Industrial Electrical Generators Using Vibration Analysis**

**Authors:** stud. Răzvan Ștefan STOICA, stud. Alexandru PAVĂL

**Scientific Advisor:** Lecturer Tiberiu PAZARA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *This paper presents one of the methods for investigating the operational status of industrial electrical generators. The measurement and analysis of generator vibrations provides important data for detecting premature wear of parts, but also for determining the degree of efficiency.*

*By using vibration data, imbalances, cracks etc. can be identified without dismantling the whole plant, which is the major advantage of this method of investigation and maintenance.*

### **21. Star Cool Refrigeration Unit**

**Authors:** stud. Vidinei VENIAMIN, stud. Sorin Jufa

**Scientific Advisor:** Flaviu KMEN

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The STAR COOL units, models SCU-40 and SCI-40 are electric powered picture frames, cooling and heating units operating on refrigerant R134a or R513A. The unit is designed to maintain cargo temperatures in a range from  $-30^{\circ}\text{C}$  ( $-22^{\circ}\text{F}$ ) to  $+30^{\circ}\text{C}$  ( $86^{\circ}\text{F}$ ). The unit is designed to operate in ambient temperatures from  $-30^{\circ}\text{C}$  ( $-22^{\circ}\text{F}$ ) to  $+50^{\circ}\text{C}$  ( $122^{\circ}\text{F}$ ). The outer front frame is constructed of marine grade aluminium, 5000 and 6000 series, designed to serve adequately as the container end wall. The rear bulkhead is made of food-approved material.*

### **22. On the Maintenance of Marine Electric Motors Using Vibration Analysis**

**Authors:** stud. Vidinei VENIAMIN, stud. Cristian Adrian DINU

**Scientific Advisor:** Lecturer Tiberiu PAZARA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Marine electric motors are sources of vibration and noise. Maintenance of these motors can be carried out invasively (e.g. by defectscopy) which means disassembly of the motor or it can be carried out non-invasively (e.g. vibration measurements, noise measurements). In this paper, the advantages of marine electric motors maintenance using vibration analysis of the motors are presented.*

### **23. Onboard Networks**

**Authors:** stud. Vidinei VENIAMIN, stud. Sorin JUFA

**Scientific Advisor:** Iancu CIOCIOI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The marine industry is going through perhaps the most significant change in thirty years regarding onboard systems. Boaters are beginning to embrace what has been commonplace in our working lives for some time now the networking of electrical and electronic components with the result that sending data from one part of the boat to another is becoming mainstream. Many systems or methods, each with their own strengths and weaknesses, are vying for market share and technical acceptance. Vast*

*changes will occur in boat wiring in the near future; changes that may, to a large extent, do away with wiring altogether.*

#### **24. On the Maintenance of Refrigeration Plant for Ships' Galley**

**Author:** stud. Nicu Gianini VÎLCU

**Scientific Advisor:** Lecturer Tiberiu PAZARA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *A ship's galley refrigeration system should be checked periodically like any other system. Temporary or total failure causes spoilage of crew food, which has a major impact on the life and condition of the crew. In this paper, the elements of the installation that are prone to repeated failures or permanent failures are presented and the steps of installation maintenance to prevent these failures are outlined.*

#### **25. Potential for Usage of Thermoelectric Generators on Ships**

**Authors:** stud. Vlad-Alexandru PIELE, stud. Răzvan-Marian PIELE

**Scientific Advisor:** Ionel POPA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Ships are still the most efficient mode of transport when all environmental aspects are considered. More than 80% of all goods shipped in the world are transported on ships. Ship transport generates a large amount of waste heat, which is today to some extent utilized as thermal and rarely as electrical energy. Ships normally have waste heat of a quantity and quality to cover all demands for thermal energy onboard. This makes electrical power generation from waste heat interesting*

#### **26. Maritime Design and Installation Guidelines**

**Authors:** stud. Cristian-Andrei ZAHARIA, stud. David POPA

**Scientific Advisor:** Iancu CIOCIOI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Specifications for Inmarsat equipment installed on board SOLAS ships that are defined in the appropriate System Definition Manuals or Technical Requirements Document for relevant Inmarsat system.*

#### **27. NPN Transistor**

**Authors:** stud. Georgiana ANDREI, stud. Alin ANGHEL

**Scientific Advisors:** Vasile DOBREF PhD, Asist. univ. Vlad MOCANU

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *At the scientific communication session, we will present the use and implementation of an NPN transistor. In the beginning, we will present*

*a brief introduction to transistors. All that will be followed by a MATLAB presentation.*

### **28. Measures to Reduce Pollution from Maritime Shipping**

**Authors:** stud. Cristian APOSTOL, stud. Andrei BRAGAU

**Scientific Advisor:** Leon PANĂ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In this presentation we will talk about the main measures to reduce pollution from maritime shipping and the main air emissions resulting from burning marine fuel and there effects. We will go over main four mesures which has the biggest effect on reducing the emission from maritime shipping and the impacts of thouse emissions on the climate and human health.*

### **29. Photovoltaic Panels That Rotate After the Sun**

**Authors:** stud. Ionuț BALAN

**Scientific Advisor:** Gheorghe SAMOILESCU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *For the first time when this project was talked about in the world, no one thought that such a thing was possible, but a few years ago a Japanese company brought up this subject which, once mastered, will create twice as much electricity as a normal system. of photovoltaic panels. The photovoltaic panels created so far have always been positioned to the east in order to assimilate the sun's rays, but have you ever considered creating photovoltaic panels that contain a special sensor that intercepts the movements of the sun? A Japanese company is working on a new solar device that can generate twice as much electricity as current models, thanks to its moving mirrors that follow the sun during the day, but this type of model can not provide continuous safety in tracking the sun's movements. In the project I present, I will show you that the design of these mobile photovoltaic panels can be perfected so as to offer maximum efficiency.*

### **30. Line Follower Robot Using Arduino**

**Authors:** stud. Robert BOBARU, stud. Cosmin DABA

**Scientific Advisor:** Cornelia-Victoria ANGHEL-DRUGĂRIN, PhD

**Institution:** Centrul universitar Babeş-Bolyai Reşita, Universitatea Babeş-Bolyai din Cluj-Napoca

**Abstract:** *The project describes a robot that we built, which uses two IR sensors following a black line on a white surface, using the Arduino Uno circuit board. It also uses two motors linked to two wheels rotating*



*independently in order to turn the robot in the right direction being powered by a 9V battery.*

### **31. Intelligent Motor Protection Relay**

**Authors:** stud. Andrei BRAGAU, stud. Cristian APOSTOL

**Scientific Advisor:** Leon PANĂ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In this presentation we will talk about the INTELLIGENT MOTOR PROTECTION RELAYS. Concerning at what they are, for what are using, about some model series types and ratings, some features and major functions.*

### **32. Electrical System**

**Authors:** stud. Alexandu RADUȘAN, stud. Oana-Lavinia SPAN (CHIRIȚĂ)

**Scientific Advisor:** -

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *This paper presents the main aspects of electric lighting system made on board of 80.000 DWT a ship “MV JAWOR” part of the “PANAMAX” category. Marine Electricity or Marine electrical power is a vital part of a ship’s operation. Without marine electricity, ships would not be able to run any of the machinery and cannot perform their core purpose of sailing from one place to another. The uses of energy-efficient light sources on the shipboards play a significant role in the today’s maritime sector. Energy efficiency has become the hot topic due to the economic and environmental factors in all sectors. The use of energy-efficient lighting systems on the shipboards can provide an important energy saving for the maritime sector.*

### **33. Single Phase Cycloconverter**

**Author:** stud. Marius-Nicolae ENI

**Scientific Advisors:** Vasile DOBREF, PhD, Asist. univ. Vlad MOCANU

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *I am presenting a project starting with a brief and concise introduction on the topic, displaying general information about single and three phase cycloconverters and their utilization in different electrical domains, focusing on their usage aboard ship. To better understand and to demonstrate how a cycloconverter works, I prepared a Matlab & Simulink simulation of a single phase cycloconverter and drew conclusions.*

### **34. Study on the Use of Magneto hydrodynamic Propulsion on Ships**

**Author:** stud. Fănică REDIU

**Scientific Advisor:** Eduard DRAGOMIR, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The design of direct-drive marine engines and ship propellers has reached an advanced stage of development, and only incremental advances in performance may be expected in the future without introduction of new technology and/or new propulsion concepts. Electrical ship propulsion systems offer many advantages over the conventional locked train gear drives. These advantages lie in the area of ship flexibility, operating flexibility, and fuel economy. Magneto hydrodynamic (MHD) propulsion systems operate on different physical principles than do propeller drives and, hence, are not subject to the same physical limits. The use of MHD propulsion for oceangoing vessels provides potential for advances in ship performance analogous to the advances in aircraft performance that followed from the development of the jet engine.*

### **35. The Electronics of an F1 Engine**

**Authors:** stud. Cristea MATEI, stud. Nicolae DRĂGAN

**Scientific Advisor:** Gheorghe SAMOILESCU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The aim of this paper is to bring to light the electrical side of a modern F1 engine and explain why the electronics are vital to the functionality of said engine. We will also touch upon the way they are used to enhance performance.*

### **36. Wind Energy**

**Author:** stud. Bogdan MIHULCA

**Scientific Advisor:** Leon PANĂ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In this scientific paper I tried to present the description and operation of a wind power plant. The different functionalities of a wind farm, their number on the globe, and the components together with their description are presented. There are numerous variations of power plants, low power wind power plant (under 100kw/h) and high-power wind power plants (over 100kw/h). All of the wind power plants on the entire globe can produce 2.5% of the energy needed for the entire globe population (430 Terawathour) and in this industry aprox 670000 people have a job.*

### **37. Electric Propulsion Systems in Naval Transport**

**Author:** stud. Victor-Matei ȘEICĂRESCU

**Scientific Advisor:** Florin POSTOLACHE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The present paper aim is to analyse the electric propulsion system on container vessels. The electro-energetic systems of this type of vessel are going to be studied, along with the advantages of the usage of alternative current, the efficiency of the electric powered systems, safety optimal operation, fuel consumption reduction, propulsion variants, the analysis of the propulsion control system and the types of the electric engines.*

### **38. Study of Naval Propulsion Systems**

**Author:** stud. Manfred Antonio STOICA

**Scientific Advisor:** Iancu CIOCIOI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Propulsion installations, which are composed of internal combustion engines, can be of several types, depending on the type of power transmission from the engine to the consumer: Propulsion installations with direct transmission; Propulsion installations with speed reducer; Propulsion installations with reducer-inverter; Propulsion installations with electric transmission; Combined propulsion installations. In the most general case, the components of the installation in the figure and the significance of the notations are: the internal combustion engine (MIA) ensures the transformation of the chemical energy resulting from the combustion of fuel into mechanical energy; mechanical couplings (CM) allow the assembly of different parts of the axial line; the push bearing (LI) takes over the thrust force developed by the propellant and transmits it to the hull; The propeller carrier shaft (API) is the part of the axial line that supports the propellant; intermediate shafts (AI) are the shafts that connect the engine to the propeller shaft; the propeller pitch change mechanism (MSPE) existing in the installation, only if the system is provided with an adjustable pitch propeller, ensures that the blades rotate around their longitudinal axes until the desired angle for the propulsion needs is obtained.*

### **39. Speed Control on DC Motor in Matlab**

**Authors:** stud. Roxana-Mădălina TÎRÎLĂ, stud. Daniel DRĂGAN

**Scientific Advisor:** Vasile DOBREF, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In our industry, DC motor is extensively used for speed control and load features; its accessibility provides effectiveness and precisely*

*output, so application of DC motor is extensive for commercial desire. Speed control of DC motor is „the bottom-line” in application where required speed is precision and correcting signal representing, and operating the motor at constantly speed.*

#### **40. ABB's Modern Technologies for Protection Against Electric Arc**

**Author:** stud. Dan-Andrei TUDOSE

**Scientific Advisor:** Leon PANĂ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The Ultra-Fast Earthing Switch of type UFES is a combination of devices consisting of an electronic device and the corresponding primary switching elements which initiate a 3-phase short-circuit to earth in the event of a fault.*

*An arc fault can arise from, for example, insulation faults and weaknesses, maloperation of a switchgear device, improper (loose) busbar or cable joints, overvoltage, corrosion, pollution, moisture, ferro-resonance (instrument transformers) and even ageing under electrical stress.*

*The protection relays with integrated arc fault protection are adapted to switchgear systems, which are important for the distribution network and its customers. In these systems the consequences of arc faults can be considerable to the personnel and the surrounding, although the probability of an arc fault is low.*

#### **41. Comparative Study of Encryption Algorithms**

**Author:** stud. Ana-Maria SITARU

**Scientific Advisor:** Vlad VASILE, PhD

**Institution:** “Nicolae Balcescu” Land Forces Academy

**Abstract:** *Encryption is a method of protecting data and communications by applying cryptographic algorithms, ensuring that only authorized persons have access to information. It can be achieved using two types of algorithms: symmetric and asymmetric. In this paper I have made a comparative study between different algorithms. Initially, I analyzed the differences between symmetric and asymmetric encryption and then I compared the algorithms from these two categories. I highlighted for each algorithm, the key length, processing speed, range of use and security level in order to observe both differences and similarities. Finally, to exemplify the actual comparison, I used the Cryptool 2 software to encrypt files of different sizes with two symmetric algorithms- Blowfish and Advanced Encryption Standard, thus observing the implementation within the program and the processing speeds of the algorithms.*

## V. SECTION: WEAPONS AND COMMUNICATIONS

### Section Committee:

#### Chairman:

LCDR Lecturer Ovidiu CRISTEA, PhD

#### Members:

Lecturer Eng. Gheorghe ICHIMOAEI, PhD

Lecturer Laura CIZER, PhD

Room LI125

### 1. Types of Anti-Aircraft Missiles that Can Be Fitted onboard of on Type 22 Frigates

**Authors:** stud. Alexandru GHINGHILOSCI, stud. Paul ILIȚOI

**Scientific Advisor:** Cătălin CLINCI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

***Abstract:** This paper proposes a reflection on the most powerful and equipped ships of the Romanian Navy, the T22 frigates and some types of anti-aircraft missiles that could be carried on board. These ships could be equipped with a wide range of anti-aircraft missiles to ensure both the ship's defense and the offensive. This paper shows some of the most powerful anti-aircraft missiles that could be put on the frigates and a brief presentation of the T22 frigates. This work starts with some general considerations about the T22 frigates, then is presented one by one, three of the world's best anti-aircraft missiles. This paper shows the very important responsibility of the T22 type frigates, the best-performing ships in the Romanian Army for national security, but also the high-performance equipment that can be placed on board.*

### 2. Dark Web

**Authors:** stud. Georgi LOLOV, stud. Hristian HRISTOV

**Scientific Advisor:**

**Institution:** Naval Academy Nikola Vaptsarov, Bulgaria

***Abstract:** In our report, we present the dangers of the Internet. Here we pay attention to the learners and how to protect themselves from possible malicious viruses that surround the Internet. We show examples from everyday life and make demonstrations of cybercrime. On the Internet, many things remain hidden from the average user, but we will reveal the deep truth in the report.*

### **3. Accomplishing a Proper Patch Antenna Array for Vital Signs Detection Based on Radar Sounding in the SHF Range**

**Authors:** stud. Valentina-Mariana LUPU, stud. David VATAMANU

**Scientific Advisor:** Simona MICLĂUȘ, PhD

**Institution:** Land Forces Academy “Nicolae Bălcescu” Sibiu

**Abstract:** *An antenna array composed of four patch antennas are modeled and simulated in CST Studio Suite Software with the aim of using them in radar detection of vital signs. Through repeated simulations we tried to get the best possible features (VSWR, directivity and efficiency). We started with a single antenna resonating at 2.3 GHz. We improved its features gradually, reaching the best results for one specific size of the antenna. Further, a matrix of four identical antennas was modelled for the same frequency. Aiming at characterizing it at even higher frequencies we switched from UHF to SHF range, namely to Ku band of microwaves. It resulted in an array with the best resonance frequency of 8.9 GHz and very good directivity. The initial features were improved up to the best possible. VSWR was always measured to compare the simulations with practical antennas. The obtained solution provides feasible features so as to be used for vital sign detection based on*

### **4. Naval Tactics and Actions of Missile Corvette 190 - “Lăstunul”**

**Authors:** stud. Paul ILIȚOI, stud. Alexandru GHINGHILOSCHI

**Scientific Advisor:** Cătălin CLINCI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *This paper proposes an inside view of actions and procedures which are produced by one of the fastest military ship of Romanian Navy, Missile Corvette 190- “Lăstunul”, known as “NPR-190”. This ship could conduct Anti-Surface War (ASuW) with an impressive range of hitting due to the missile possibility of attack. In this work paper, it is presented all tactical methods of actions regarding Romanian Military Tactics and the capacity of this Missile Corvette class. This paper begins with “The Waiting Position” method, followed by “At Calling” method and other three tactical actions that it is possible for this type of ship. It showcases why this ship has an important responsibility in security and operational activity, nevertheless why this class ought to be value by Romanian Navy in future multinational naval exercises.*

### **5. Antisubmarine Warfare Procedures: Simulation at the Proteus Tactical Simulator**

**Authors:** stud. Robert-Bogdan ICHIM, stud. Marian MENU

**Scientific Advisor:** Cătălin CLINCI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *This paper will address issues related to the antisubmarine warfare procedures, as well as their use in combat. It will contain various information about how military ships can fight with submarines, presenting some methods on how to detect, track, follow, and, in the end neutralize them. These types of attacks, can be done either with antisubmarine bombs or with torpedoes. We will also see how helicopters and planes can help ships with the antisubmarine warfare. Finally, the paper will end with a simulation in Proteus tactical simulator, where it will be shown practically how ships attack and destroy submarines.*

## **6. The Evolution of Sea Fighting**

**Authors:** stud. Alexandru-Vlăduț SAVA, stud. Valerică STÎNGA

**Scientific Advisor:** Cătălin CLINCI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The paper aims to present the most important periods of naval battles and how the armies act in case of maritime conflicts. In my project I will present the evolution of the war at sea. First, I will present some details about warships and then I will talk about sea fighting and its evolution. I will detail some fighting strategies for certain situations. I will also talk about how ship technologies have advanced over time, taking some important timelines such as World War II. I will emphasize some aspects that I consider the most important in the battle at sea and will be presented based on the evolution of war and society. I will end by expressing my point of view on how the battle on the surface of the seas and oceans will evolve in the future.*

## **7. Research of a Maritime District Using an USV Drone**

**Author:** stud. Mihai-Danut TIMOFTE

**Scientific Advisor:** LTJ. Eng. Silviu-Nicolae POPA PhD Candidate

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *This paper includes research about the using of unmaned surface vehicle in army. UAVs and drone technology have greatly changed the form of warfare and had a major impact on the psyche of democratic society. Firstly, several general aspects of drones will be presented, including their impact on society. Secondly, the general definition of USV will be given; more precisely what it is and where we can exploit their capabilities. Thirdly, the research of a maritime district will be pointed out by several examples of the advantages that this concept has. Finally, a solid conclusion will be drawn showing how useful a USV can be.*

## **8. Morse Code**

**Authors:** stud. Christiana Maria MORARU, stud. Nikita-Sabina URUSU

**Scientific Advisor:** Lt. Cosmina NECULCEA

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Communication is vital not only in maintaining interpersonal relationships but also in message transmission. Due to the development of the technology, fast correspondance on long distances has been possible since the early 18th century. The purpose of this paper is to provide information about the use of the Morse code in navigation. The article starts with a short history about the development of the code, a general presentation of the concept and describing how it applies in air and sailing navigation.*

## **9. Applying AI for Military Classification Tasks Through Universal Machine Learning Workflow**

**Author:** stud. Eduard-Andrei ONOFREI

**Scientific Advisor:** Ovidiu CRISTEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Artificial intelligence is a branch of science that wants to solve the complex problems of the human brain. This characteristic is made by AI through information gathered from human beings and put in math algorithms in a friendly way for the viewer's interface and for the computer's processor. It solves problems that can usually be solved by any person, or almost any person, but in a different manner. This branch is associated sometimes with psychology, cognitive processes, philosophy or biology. All of them combined with IT results Artificial Intelligence. This project uses Artificial Intelligence to find different targets on the sea or in the air and to make a classification of them with the help of a premade database.*

## **10. The SSBN Class of Submarines**

**Author:** stud. Cristea MATEI

**Scientific Advisor:** Associate Professor Alina BALAGIU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The aim of this presentation is to shed some light on the mysterious SSBN class of submarines. I will be talking about their origins and predecessors, the choices made for their design, their arsenal, use and how they operate as a single unit. I will also touch upon their stealth capabilities, as they are stealth launch platforms for ballistic missiles, and their importance in the modern era. I will be using the Ohio class submarine of the US navy as an example throughout the presentation.*



## VI. SECTION: MECHANICAL ENGINEERING

### Section Committee:

#### Chairman:

LCDR Lecturer Narcis VOLINTIRU, PhD

#### Members:

Lecturer Florin POSTOLACHE, PhD

Lecturer Aurelia CHIOIBAŞ, PhD

Lecturer Dana ZECHIA, PhD

Room E122

### 1. On the Maintenance of a Ship's Shaft Line Using Vibration Analysis

**Author:** stud Răzvan Gabriel BRÎNZEI

**Scientific Advisor:** Senior Lecturer Tiberiu PAZARA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

***Abstract:** The shaft line is a vital component of a ship's propulsion system. It is subject to vibrations from several sources. The stress caused by these vibrations can lead to failure or damage. One of the current techniques used for shaft line maintenance is vibration measurement and analysis. In this paper, the author proposes to analyse these vibrations using a simplified computer model.*

### 2. Cyber Security

**Author:** stud Bogdan-Ionut BULACU

**Scientific Advisor:** Florin POSTOLACHE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

***Abstract:** Phishing is a method of identity theft that seeks to obtain personal or confidential data from an organization's customers - regardless of its area of activity. These can later be used illegally by criminals to make transactions on the client's account. To find out, phishing attacks use an electronic communication channel (e-mail, telephone) or a malicious program that exploits system vulnerabilities to steal data.*

### 3. Technics for Working with Autodesk Tools – Study of the Ship Geometry Using Fusion 360

**Author:** stud Cristian-Felician ZAHARIA

**Scientific Advisor:** Mihaela-Greti MANEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *A ship's hull is characterized by a very complex geometry, which raises a lot of challenges in designing. Computer-Aided Design (CAD) can be a real solution to this problem. This project is a exemplification of a application of using a CAD Software – Autodesk Fusion 360 as a tool for designing the ship geometry. As an example, I have created a 3D design of the yacht “The Shape” produced by the design Studio Lazzarini. The originality of this work resides in the fact that the design started as a schematic 2D image posted on the producer’s web site. After the creation of the 3D design, I have transposed it into a 3D object using a 3D Printer. The conclusion is that in naval design, theoretical knowledge and CAD skills are a essential requirement for developing the professional skills needed in this field, witch necessitate the use of advanced CAD tools (Tribon, Ansys, Delftship, etc).*

#### **4. Optimizing Energy Consumption in Ports Using Heat Pumps**

**Authors:** stud Adrian DIACU, stud. Florina DRĂGHICI

**Scientific Advisor:** Dumitru DASCĂLU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The paper aims to highlight a solution for energy production. It is environmentally friendly, cheap and extremely efficient in port activity using renewable energies from sea water.*

#### **5. Identity Theft**

**Author:** stud Gabriel HEREMCIUC

**Scientific Advisor:** Florin POSTOLACHE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Identity theft is such a vague term, because it is never limited to just an email account, but to the entire base of personal information about you. In the case of bank fraud, banks prefer to return money to victims, because these amounts are usually not very large for these institutions and revealing these incidents would cause problems to their image, but these institutions are obliged to compensate victims regardless of the amount.*

#### **6. Leadership Decision-Making Process in the Engine Compartment**

**Author:** stud Joița CONSTANTIN

**Scientific Advisor:** Carmen COJOCARU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *This study emphasizes that Decision making is a continuous process of correlating and harmonizing objectives with resources, the decision representing the result of information processing by a person or a group of people. Decision making is the essence of leadership. We identified*

three important stages in decision making process: information, design and selection / evaluation. That was an argument to detail the opportunity to use several decision models in the decision-making process in the engine department: Michel Crozier model, Victor H. Vroom model, group decision model.

## **7. Using MatLab Software to Study the Process of Loading/Unloading of Weights Onboard of the Ship**

**Authors:** stud Robert MUNTEANU, stud. Oana NIȚESCU

**Scientific Advisor:** Mihaela-Greti MANEA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The study of loading and unloading of weights is a very common field in the commercial navy. This study is particularly important because changing the weight of the ship has a very large impact on the buoyancy and stability of the ship. In our work we will present some aspects related to the study of loading and unloading weights onboard of the ship and will determine the longitudinal/transversal flotation and stability of the ship will change. To perform this study, we need the following initial parameters of the ship: ship displacement, ship main geometry (length and draft), the definition parameters for buoyancy and stability, the navigation characteristic and, finally, the value of the weight and the position of the loading/unloading point. The originality of the works consists in carrying out a computer-assisted study for which MatLab was used as a programming medium. The presentation contains illustrative case studies for the chosen study topic.*

## **8. Psycho-Social Mechanisms of Social Influence Involved in Successful Leadership**

**Author:** stud Mircea Nicușor PURCĂREAȚĂ

**Scientific Advisor:** Carmen COJOCARU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The study aims to demonstrate that achieving effective Leadership uses a series of mechanisms of positive social influence that lead to collaborative behaviors, competition to achieve common goals. The leader, as a social actor, determines to the members of the work team from the engine compartment, the development of those behaviors through which the common objectives of the ship's mission are achieved. The mixed leadership model in the engine department explains the relationship between subjective factors (leader's personality) and objective factors (characteristics of the specific work situation in the engine department) in achieving social influence, being much more effective from a practical point of view. The*

*study also advocates the practical exercise of these mechanisms of social influence in order to obtain "Leadership Everyday".*

## **9. Features of the Personality of the Ship Leader in the Engine Compartment**

**Author:** stud Mihai SALARIU

**Scientific Advisor:** Carmen COJOCARU, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *The study aims to analyze the most relevant personality traits of the naval leader that contribute to the practice of effective leadership in the Engine Department. The scientific arguments of this study are based on the mixed model of Leadership in which effectiveness is a function of the relationship between the Personality of the Leader and the work situation. Also, our interpretations consider the tripartite model of Personality: Temperament, Aptitude (Intelligence and Creativity) and Character.*

## **10. Principles and Attributes of the Leadership in the Engine Compartment**

**Author:** stud Dumitru VÎJIALĂ

**Scientific Advisor:** Carmen COJOCARU, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *The study aims to determine and explain the special importance of respecting certain principles and attributes in the exercise of leadership in the Engine Department. Among the key principles that lead to high-performance results, this study describes several: Build Vision, Nurture Collaboration, Promote Performance, Cultivate Learning, Ensure Results. Also, an effective leader governs leadership in the engine compartment using a number of attributes, including: Know yourself and seek self-improvement Be technically proficient, Seek responsibility and take responsibility for your actions, Make sound and timely decisions, Set the example, Know your people and look out for their well-being, Keep your workers informed, Develop a sense of responsibility in your workers, Ensure that tasks are understood, supervised and accomplished, Train as a team.*

## **11. Aspects of the Implementation of the Concept of Hybrid Vehicles**

**Author:** stud Anamaria-Daniela BÎRZAN

**Scientific Advisor:** Dumitru DASCĂLU, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *This paper proposes to find the explanation for the real achievement of the hybrid electric vehicle. The car industry is undergoing a major change since its inception, namely the transition from the internal*

combustion engine to the electric motor. Companies are investing more and more in this new innovation, so there are licensing agreements aimed at conquering new markets. Electric and hybrid vehicles are becoming more and more popular in the world, being the perfect cars for crowded cities. More and more drivers in our country are choosing the option of an environmentally friendly vehicle. Hybrid-powered cars are the main option, which results in low pollutant emissions. To date, about 6 million hybrid cars have been sold globally, a small percentage of total car sales with standard engines. The reason for this situation is related to the price charged for a hybrid car, which may include people's distrust of advanced technology.

## **12. Calculation the Diameter of the Ballast Pump Shaft**

**Author:** stud Florentin-Iulian BICĂ

**Scientific Advisor:** Aurelia CHIOIBAȘ, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** A system of pipes and pumps that serves to take in and expel the liquid ballast of a ship. Ballast is usually taken on in ballast tanks (sections of double hull, deep tanks, on-board and below-decks tanks, and the forepeak and afterpeak); in some instances, it is taken into the fuel tanks, and on tankers into the cargo tanks. A ballast tank is a compartment within a boat, ship or other floating structure that holds water, which is used as ballast to provide hydrostatic stability for a vessel, to reduce or control buoyancy, as in a submarine, to correct trim or list, to provide a more even load distribution along the hull to reduce structural hogging or sagging stresses, or to increase draft, as in a semi-submersible vessel or platform. The productivity of the ballast-system pumps in a freighter is generally calculated to expel all ballast in four to ten hours. Ballast pumps are crucial for the operation of most vessels. They pump water in and out of the ballast water tanks during loading, off-loading and trim of the vessel.

## **13. Cyber Security**

**Author:** stud Bogdan-Ionut BULACU

**Scientific Advisor:** Florin POSTOLACHE, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** Phishing is a method of identity theft that seeks to obtain personal or confidential data from an organization's customers - regardless of its area of activity. These can later be used illegally by criminals to make transactions on the client's account. To find out, phishing attacks use an electronic communication channel (e-mail, telephone) or a malicious program that exploits system vulnerabilities to steal data.

#### **14. Cyber Crimes**

**Author:** stud Valentin Adrian BUTA

**Scientific Advisor:** Florin POSTOLACHE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *During this presentation I chose to talk about cyber crimes, a very controversial topic of the modern world.*

#### **15. Main Characteristics of a 7500 TDW Cargo Ship**

**Author:** stud Teodor CEAPĂ

**Scientific Advisor:** Aurelia CHIOIBAŞ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Presenting the main characteristics of a 7500 Tons Dead Weight cargo ship with a maximum length of 107,4 meters, including main engine propulsion information. It will be presented the following characteristics: water line length, Length between perpendiculars, beam of waterline, designed water line, construction height, maximum speed of the ship, hull displacement, the area of the master surface, abscissa of the centre of the hull, block coefficient, coefficient of finesse of waterline, prismatic coefficient, the area of the transfer section of the bulb, elevation of the centre of the surface of the cross section of the bulb, density of the water, kinematic viscosity of the water, gravitational acceleration. The last three being considered to the international values.*

#### **16. Piston Manufacturing Technology**

**Author:** stud Ciprian-Emil BABELEA

**Scientific Advisor:** Aurelia CHIOIBAŞ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The technical conditions concern the dimensional accuracy, the shape, the reciprocal position of the surfaces and their quality. The tolerances imposed on the nominal dimensions of the existing surfaces and the bolt bore are optimized in the assembly process, based on their sorting by size or weight groups. The pairing of piston-bolt, piston-cylinder (segments) is highlighted by the markings made by painting or by the codes obtained by punching. Piston mass tolerance is allowed within the limits of the total piston mass.*

#### **17. Dual Fuel Engines: Gas and LPG**

**Author:** stud Toma-Ionuţ DOBRE

**Scientific Advisor:** Ionel POPA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The evolution of propulsion systems and the construction of more and more advanced naval engines has led to the emergence of increasingly interesting challenges for all those involved in this phenomenon. On the one hand, there was an attempt to find new technical solutions that would improve the system, and on the other hand to highlight the energy efficiency of these complex equipment made and mounted on board ships. LPG is the fuel of the future – environmentally friendly and smart without sacrificing performance or efficiency. For example, LPG contains close to zero sulfur and meets the requirements for Sulfur Emission Control Areas.*

### **18. NotPetya Cyberattack**

**Author:** stud Petruț Cosmin GLOGOVEANU

**Scientific Advisor:** Florin POSTOLACHE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *NotPetya is among the most fascinating malware incidents of recent history and came shortly after the infamous WannaCry Ransomware outbreak. Part of the reason why it’s so interesting is due to the way that it spread so rapidly between devices and networks, as well as the far-reaching impact that it had. To this day, the group behind NotPetya remains one of the most advanced and active cyber threat groups.*

### **19. Dual Fuel Engines: Gas and LPG**

**Author:** stud Mihnea-Gabriel GROSU

**Scientific Advisor:** Ionel POPA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The evolution of propulsion systems and the construction of more and more advanced naval engines has led to the emergence of increasingly interesting challenges for all those involved in this phenomenon. On the one hand, there was an attempt to find new technical solutions that would improve the system, and on the other hand to highlight the energy efficiency of these complex equipment made and mounted on-board ships. LPG is the fuel of the future – environmentally friendly and smart without sacrificing performance or efficiency. For example, LPG contains close to zero sulfur and meets the requirements for Sulfur Emission Control Areas.*

### **20. Ventilation Installation in the Engine Compartment of an Oil Tanker**

**Author:** stud Costin Daniel MOCANU

**Scientific Advisor:** LCDR Lecturer Narcis VOLINTIRU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Ventilation, heating and air conditioning systems are designed to process the air so that living conditions for crews and passengers are maintained in the ship's premises, storage of cargo and ammunition for military ships and optimal operation of the equipment. Heating is the process by which the temperature of the air in the compartments is raised from a heat source or by the introduction of hot air. The ventilation system circulates the air, eliminating heat, noxious substances, water vapor and smoke without treating the humid-thermal air. The air conditioning system performs a complex air processing (heating, cooling, humidification, drying) to achieve comfort and working parameters. In the case of submarines and military ships with watertight compartments, the air conditioning system replenishes the oxygen consumed and retains the carbon dioxide retained on board.*

## **21. Piston Manufacturing Technology**

**Author:** stud Mario-Robert RIZEA

**Scientific Advisor:** Aurelia CHIOIBAŞ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *This research aims to produce pistons a lighter and stronger piston, even in high compression and high engine speed conditions. The piston fabrication process is carried out by super forging using Aluminum as a raw material with a compound choice by Silicon or Magnesium. In addition, the outer layer of the piston is covered by molybdenum with the coating process as nanotechnology to prevent corrosion. Furthermore, the finishing is controlled by the programming system machine named CNC (Computerized Numerical Control). In addition to CNC, the automation system is carried out by the KIRIU machine which is also used in this study. The results of this study show that the use of Al-Si alloy base material has better piston quality and able to withstand high compression or high engine speed. Then, the Al-Si superforging piston compared to the two final automation processes of CNC and KIRIU. The evaluation results have proved that the KIRIU machine provides high accuracy and the actual production increases by 20% compared to CNC.*

## **22. Dimensioning the Cooling System of a Main Engine Using a Centrifugal Pump**

**Author:** stud Andrei-Valentin SEMCO

**Scientific Advisor:** Aurelia CHIOIBAŞ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Cooling enables the engine metals to retain their mechanical properties. The usual coolant used is fresh water: sea water is not used*



*directly as a coolant because of its corrosive action. Water carried in pipes is used to cool machinery. The main engine is cooled by two separate but linked systems: an open system (sea-to-sea) in which water is taken from and returned to the sea (seawater cooling), and a closed system where freshwater is circulated around an engine casing (freshwater cooling).*

### **23. The Colors of Hydrogen**

**Authors:** stud Victor-Andrei SPOIALĂ, stud. Marius Valentin PREDA

**Scientific Advisor:** Ionel POPA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In our presentation we will talk about the colors of hydrogen and his purpose as the fuel of the future. In this topic we discovered what hydrogen is made of and how to get it. There is more types, different ways to get it and different prices for each type of IT. In conclusion the hydrogen could be the fuel of the future.*

### **24. Heat Pumps**

**Authors:** stud Florin STANILĂ, stud. Neculai ȘTEFAN

**Scientific Advisor:** Ionel POPA, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Today there are many types of heating systems, each with its own characteristics and costs. In our work we will present you the heat pumps and the advantages over the usual systems used. A heat pump is a device that transfers thermal energy between spaces, usually between an enclosed space and the outdoors.*

### **25. Design of the Bilge Installation on an Ore Carrier Vessel**

**Author:** stud Vlad-Teodor VIERU

**Scientific Advisor:** Aurelia CHIOIBAȘ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The bilge system is designed to drain the ship's compartments and to evacuate overboard the waste water resulting from various causes. Drainage is done with one or more pumps, coupled to a branched main, at the end of which are provided collection outlets. The liquids discharged overboard consist of water resulting from condensation, precipitation, leaks in the hull and piping, openings in the decks, etc. The location of the bilge system varies according to the type of ship. Small ships have each compartment connected to the bilge distribution valve box, while large ships are provided with a tunnel located in the double bottom. At the end of the suction pipe, a check valve is mounted, which has the purpose of keeping the suction pipe full of water at all times, thus ensuring the maintenance of the*

*pump priming, but also the unique direction of water flow through the installation, from inside to outside.*

## **26. Water Supply Installation with Hydrophone. Hydrophone Feed Pump**

**Author:** stud Florin VÎRLAN

**Scientific Advisor:** Aurelia CHIOIBAŞ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: The water supply installation is divided into several branches depending on the nature of the water supplied: drinking water supply installation; technical water supply installation; seawater supply installation. The water installations consist of: Tanks, pumps, hydrophones, treatment systems and distribution systems related to the plant. The waterworks in the installation work with a useful volume between maximum and minimum volume. When the pressure drops in the hydrophorus, a pump is switched on to feed it.*

## **27. Manufacturing Technologies for a Tie-Rod**

**Author:** stud George-Cristian ZELCA

**Scientific Advisor:** Aurelia CHIOIBAŞ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: Marine engines are manufactured with different components, which are held and tied together to complete the engine structure with the help of tie rods. Tie rod is a long well-built rod with bolts at both the end. This rod holds on the three major engine components i.e. Cylinder block, “A” frame, and crankcase in compression and transmits the firing load to the bed plate. The tie rods are hydraulically tightened so that the whole engine can be held in compression.*

## **28. Intake Valve Manufacturing Technology**

**Author:** stud Ion-Sebastian BUCEL

**Scientific Advisor:** Aurelia CHIOIBAŞ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: This topic aims to present the manufacturing technology for the intake valve. They play a very important role in the operation of internal combustion engines. In the engine assembly, the intake valve has the role of opening and closing the fuel inlet in the combustion chamber. During operation the inlet valve is subjected to compression (rod end or rod) at relatively high temperatures, oxidation and corrosion. For this purpose, when executing the valves, rigorous conditions are imposed regarding the relative position of the plate and the valve tail in relation to the rod, as well*

*as on the rectilinearity of the rod. The transition from rod to plate must be continuous. Due to the working conditions, special, heat-resistant and anti-corrosion steels are used for the intake valve. The constructive form, as well as the character of the series or mass production, makes possible the automation of the mechanical processing process. Modern technologies provide very precise semi-finished products with small additions, so that machining can be done only by grinding.*

## **29. Passenger Ship. Sizing of the Cooling System with Centrifugal Pump for Main Engine**

**Author:** stud Robert-Cătălin DOMINTE

**Scientific Advisor:** Aurelia CHIOIBAȘ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The presence of the cooling installation is determined by the need to force the evacuation of a part of the heat released by combustion, in order to make possible the continuous development of the working process and the maintenance of a thermal level corresponding to the operation at the optimal engine parameters. The cooling system with liquid has some advantages and some disadvantages compared to air cooling. Advantages include: more uniform engine cooling; the possibility of preheating at start-up; the possibility of creating a common block for the cylinders; lower noise; lower system power consumption; achieving a 5-10% higher liter power than those achieved with air-cooled engines; lower thermal stresses.*

## VII. SECTION: FUNDAMENTAL SCIENCES

### Section Committee:

#### Chairman:

Lecturer Adriana SPORIȘ, PhD

#### Members:

Lecturer Anda OLTEANU, PhD

Lecturer Eleonora RĂPEANU, PhD

Lecturer Edith Hilde KAITER, PhD

Room E121

### 1. Application of Learning Management Systems for English Language Studying

**Author:** stud. Anastasiia SOSEDSKA

**Scientific Advisor:** Professor Vladlen SHAPO, PhD

**Institution:** Odessa, National Maritime Academy

**Abstract:** *Last decade a true jump in complex IT-based technical systems development has occurred. In maritime field Industry 4.0, IIoT technologies are implemented actively. Modern development directions and international communications require improving IT terms knowledge. Majority of seafarers communicate with colleagues in English and must improve their level nonstop. Without a satisfactory level of English knowledge, it's impossible to get any job in the maritime branch and to communicate with colleagues from NATO. By IMO statistics about 80% of accidents in the sea happen because of human errors. Some of them are caused by misunderstanding between people, including language problems. Implementation of MOODLE and ILIAS LMSs allows to automate some aspects of English language studying without teacher's help and to realize self-control. This allows using free base software environment and created additional software tool for flexible formation of studying material and self-control realization using the possibility of tests creation.*

### 2. Green Energy: A Path to Country Development

**Author:** stud Andreea-Alina PETRIȘOR

**Scientific Advisor:** Camelia ALIBEC, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *The world's population continues to grow at a high rate, therefore today's population is twice that of 1960, and is projected to increase further to 9 billion by 2050. This means that the percentage of the global energy*

used in cities is increasing considerably. Green energy is a renewable source of energy and it cannot be depleted. Bioenergy helps stimulate regional economic development and employment by providing new, decentralised and diversified income streams from bioenergy and biomass production. Biomass energy systems offer significant possibilities for reducing greenhouse gas emissions due to their immense potential to replace fossil fuels in energy production. The development of efficient biomass handling technology, improvement of agro-forestry systems and establishment of small and large-scale biomass-based power plants can play a major role in rural development and sustainable utilization of biomass.

### **3. The Beginning of the English Church**

**Authors:** stud Narcis ANIȚEI, stud. Andrei BODNARIU

**Scientific Advisor:** Assoc. Prof. Delia LUNGU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The aim of this presentation is to show the means and reasons behind the instauration of the English Church. We wil begin by taking a look at the royal family, which played a major role in the establishment of the English Church and continue by presenting the external and internal problems which led them to support this idea. All the problems the country had to face will be seen through the eyes of King Henry VIII (who was the ruler at the time) and we will show the thought processes which made him decide that the only solution to England's problems, that would also advantage him, was to separate from the Pope and make a new church of his own.*

### **4. The Power of Human Connection**

**Authors:** stud BĂJENARU Alexandra, stud. Dorina COMĂNICI

**Scientific Advisor:** Lecturer Corina SANDIUC, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The warm feeling of human connection is extremely important in maintaining our overall emotional and physical health. In fact, dozens of studies have shown that people who have satisfying relationships are happier, have fewer health problems and live longer. Human connection is an energy exchanged between people who pay attention to one another. It has the power to deepen the moment, inspire change and built trust. The aim of this presentation is to highlight the importance of having human interaction, more specifically the one face to face, and to describe how the lack of it affects our lives. Despite the social distance we have been going through, we believe that people all around the world can find the way to rebuild this meaningful connection.*

## **5. Language as a Part of NATO**

**Author:** stud Andrei BAR

**Scientific Advisor:** Assist. prof. Brândușa-Oana NICULESCU, PhD

**Institution:** “Nicolae Bălcescu” Land Forces Academy

***Abstract:** The last century experienced important breakthroughs in terms of human neurology, psychology and linguistics, but it also made room for new questions, as scientists were trying to solve the old ones. Under those circumstances, they were wondering if the language we spoke was shaping our way of thinking about the world that surrounds us. Through various studies, pieces of information were collected by researchers, who managed to demonstrate their hypothesis and successfully asserted that the way people speak influenced their thoughts and perceptions on reality. At the same time, the benefits of speaking two or more languages began to gain scientific value, backing up the recent neuro-linguistic data gathered. This article presents the results of those studies and analyses, from a military perspective, the ways by which NATO as a multinational alliance is implementing new methods of development through one of its vital aspects: communication and cultural understanding between all its members.*

## **6. Legal Justification for Banning and Limiting Certain Rights and Freedoms of the Military**

**Authors:** stud Ecaterina-Ioana BILBOREANU, stud. Raluca Florentina DRĂGHICI

**Scientific Advisor:** Assoc. Prof. Teodora Aurelia DRĂGHICI

**Institution:** “Nicolae Balcescu” Land Forces Academy

***Abstract:** In this paper we will capture aspects regarding the legal justification of the prohibition and limitation of certain rights and freedoms for the military. Thus, we will discuss elements regarding the rights and freedoms provided in the Constitution, we will continue by presenting and customizing those restricted to military personnel and how they influence the welfare of both the system and military personnel. In addition to the above, we will outline the legal framework for which they have implemented. Specifically, we will emphasize the prohibitions and restrictions and the way they reflect on rights and freedoms. Finally, we will present how they have an effect on the civilian population and how they are set up to protect them.*

## **7. The Infinite Life of Pi**

**Authors:** stud Roberta-Mihaela CONSTANTIN, stud. Alina-Elena CRĂCIUN

**Scientific Advisors:** Eleonora RAPEANU, PhD, Dan LASCU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *To understand the „pi” concept, try to measure a circle. The diameter and radius are easy, but, to get the circumference, you’ll need a measuring tape, unless there’s a better way, the number „pi”. Estimates of it appear in the works of ancient Greek, Chinese mathematicians, which estimated it by inscribing polygons in circles. Today, they can’t figure out the exact value of this number. In fact, „pi” is an irrational number, one that can never be expressed as a ratio of two whole numbers. To write it down in its decimal form, you’d have an on-going series, starting with 3,14 and continuing forever! That’s why, instead of trying to write out an infinite number of digits every time, we use the Greek letter „pi”. The computers can only calculate two quadrillion digits of it, but not it all. So, what’s the value of pi? We don’t know, no one does and probably never will.*

## **8. When America Landed on the Moon, the Whole World Did**

**Authors:** stud Hans CRĂCIUN, stud. Laurențiu BOBOC

**Scientific Advisor:** Assist. Prof. Isabela-Anda DRAGOMIR, PhD

**Institution:** “Nicolae Balcescu” Land Forces Academy of Sibiu

**Abstract:** *Mankind’s giant leap: on July 20, 1969, Neil Armstrong became the first man in human history to step on the moon. The moon landing had a huge cultural impact on the world, always reminding us that humans are capable of great things. It was, indeed, in the words of Neil Armstrong himself, “one small step for man, one giant leap for mankind”. The Apollo 11 mission managed to unite all the people of the globe, empowering them with the idea of unity and making them realize that only together people can achieve impressive things. For an invaluable moment in known history, all human beings were truly one, proud of what had just been accomplished. This article sets out to discuss the context in which this breakthrough was possible, to highlight some aspects of the landing, and to emphasize the cultural impact that the Americans’ success has had on the rest of the world. We will conclude by underlining the moon landing’s most powerful effect: it was the moment when not only an entire nation came together, it was the moment when all mankind received a breath of fresh air, the moment when people began to dream, the moment when everyone realized that anything was possible.*

## **9. The Importance of the U.S. Armed Forces in the American Culture**

**Author:** stud Ionuț Valentin DAN

**Scientific Advisor:** Assist. Prof. Brândușa-Oana, NICULESCU, PhD

**Institution:** “Nicolae Bălcescu” Land Forces Academy of Sibiu

**Abstract:** *Our opinions and views have been influenced throughout the years by how the media and other entertainment outlets, such as movies and books, have depicted the military. We were conditioned to believe that soldiers are ruthless machines trained to kill. Few outside the military actually understand the values, dedication, sacrifice and its influence on the outside world. From its birth and establishment in 1775, during a period of unrest and violence, the military played a vital role in earning and maintaining independence and freedom for the American people. Each branch of the Armed Forces has its own specific values: The Army values loyalty, duty and respect while the Marine Corps values honor, courage and commitment. The Air Force values integrity, service before self and excellence in all they do. Above all else, every military branch holds honor and integrity as their highest core value and every service-man and service-woman is taught, right from the moment they join the Armed Forces, that no matter the situation, no one is left behind. We are biased to believe that a nation's military power is built only on material and economic factors. Recent studies have shown that a great number of other factors, such as education, civil-military relations and culture play an important role too. This paper aims to present the importance of the military in the American culture and the intrinsic relationship between the two.*

## **10. The Use of CTD in Siutghiol Lake**

**Authors:** stud Iulia-Diana LUP, stud. Maria Florentina COADĂ

**Scientific Advisors:** Dinu ATODIRESEI, PhD, Andra NEDELUCU, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *For over a decade, the CTD was not used in the Siutghiol Lake. This paper aims to provide an overview of the procedure and its various benefits. Firstly, there will be a brief introduction that includes the definition of the key term (CTD) and its purpose. After that, the following two slides will show dates about location of the lake, its dimensions and information about fauna and vegetation that exist in the Siutghiol Lake. Secondly, the CTD system will be present. There will be information about the main parameters that it generates, the sensors that it uses, and the operational mode. Finally, there will be a conclusion regarding to our topic!*

## **11. Enchanted Myths and Legends from Irish Folklore**

**Author:** stud Mara Alexandra BASTEA

**Scientific Advisor:** Assist. Prof. Brândușa-Oana, NICULESCU, PhD

**Institution:** "Nicolae Bălcescu" Land Forces Academy of Sibiu



**Abstract:** *The Irish folklore is part of the vast Celtic mythology, and related to Welsh, Scottish and Brittonic folklore. It consists mainly of pre-Christian beliefs and contains a multitude of oral circulated, and later, handwritten tales of various types of warriors and supernatural beings. It is well known that the Irish mythology is still an important part of the national identity, bringing people together and filling younglings' childhoods with magical and adventurous stories. The folklore is compartmented into 4 cycles, each having its own heroes, creatures and Gods, which all-together represent one of the most well-preserved treasures in the Celtic world, being recorded by monks in the 11th century. This paper aims to present some of the most famous Irish myths, legends and tales which have been transmitted from parent to child throughout the years and which are still present in the Irish culture nowadays.*

## **12. Sea, Swell and Surf**

**Authors:** stud Maria Cătălina DAN, stud. Cristina Elena COSTEA

**Scientific Advisors:** Dinu ATODIRESEI, PhD, Andra NEDELUCU, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *This paper aims to present some of the characteristics of the following types of waves: sea, swell and surf. In this respect, there will be presented various types of waves, especially those caused by wind. Sea, swell and surf are types of waves that have a profound and widespread impact on maritime operations. Therefore, at the end of the presentation you will be able to have a clear picture of the influence of the wind on the sea conditions along with its effects on maritime operations.*

## **13. Real vs Fake News: Harmful Consequences of Disinformation Discourse in a Society Addicted to Social Media**

**Authors:** stud Maria-Daria ION, stud. Maria DEAC

**Scientific Advisor:** Assist. Prof. Brândușa-Oana, NICULESCU, PhD

**Institution:** "Nicolae Bălcescu" Land Forces Academy of Sibiu

**Abstract:** *Disinformation and propaganda have always been the most efficient strategies used by many politicians, generals or criminals to achieve their political or economic goals, to provoke fear, anxiety and division among the enemy population. However, over the past few years, the problem of disinformation has become the most dangerous threat for countries from all around the world, as the possibilities offered by technology and internet are increasingly growing. The paper aims at defining the concept of "fake news", its manifestations at the level of discourse and the contribution of internet and social media platforms in spreading false information. It also focuses on the impact of the language of*

*fake news and social media on the United States of America's and the United Kingdom's political decisions during the Brexit and the 2016 U.S. presidential election, and methods anyone can use to locate fake discourse and identify false information on the internet.*

#### **14. The Theory of Static Decisions**

**Authors:** stud Izel MEMEDULA, stud. Andreea-Cătălina PASĂRE

**Scientific Advisor:** Dan LASCU, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

*Abstract: The theory of static decisions presupposes the knowledge of the possible consequences of the adoption of different decisions of representation and the quantitative expression of the gain or of the products for the expression of each possible loss of decision and for the different possible values of the parallel  $\theta$ . The actual situations require decisions to be taken and the selection must be made informed of the selection with two other important aspects related to the possible consequences of a decision and of a priori information on the parameter. So decision theory is based on the following strategies: Bayesian strategies and minimax strategies, in fact it also has a series of criteria for choosing the optimal decisions in case of uncertainty: Hurwicz criterion, Savage criterion, Bayes-Laplace criterion, Wald criterion.*

#### **15. Numerical Solution of Algebraic and Transcendental Equations Using Python**

**Authors:** stud Marian-Valentin MOISĂ, stud. Alex-George MIHAIL

**Scientific Advisor:** Lecturer Elena-Grațiela ROBE-VOINEA, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

*Abstract: This paper aims to give an insight into the process of implementing numerical algorithms into Python. The objective is to create a simple and easy-to-use GUI interface for computing algebraic and transcendental equations. It comprises a brief introduction, information about secant method and bisection method, along with the steps that were followed until completion.*

#### **16. Healthy Life Style**

**Author:** stud Ionuț-Sorin NEDELUCU

**Scientific Advisor:** Assoc. Prof. Alina BALAGIU, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

*Abstract: The paper tries to depict the rules of a healthy lifestyle. The most important factors to reach this target are the nutrition, basic sport activities, and not to abandon the idea that everything should be done of a healthier*

life. There are also some recommendations of what things not to do and not to ingest for a better and longer life.

### **17. Inside the U.S. Special Forces' achievements – the Green Berets**

**Authors:** stud Radu-Mihai POPA, stud. Valentin-Cristian OSIAC

**Scientific Advisor:** Assist. prof. Brândușa-Oana, NICULESCU, PhD

**Institution:** “Nicolae Bălcescu” Land Forces Academy of Sibiu

**Abstract:** *The ever-changing war and continually military development have always required highly specialized personnel, capable of interoperability. The United States Special Forces has played a tremendous role in shifting the mass-war idea to the professional one, training the world's most elite units, competent of executing some of the most demanding missions in some of the harshest conditions, working with foreign special forces from all over the world, using English language to break the linguistic barrier. The rigorous training made by the Green Berets is required to assure that they are always prepared to surpass any kind of mission, regardless its stress or risk level. Since 1952, their effort and sacrifice stand as a landmark of bravery and mental attitude, being often tasked with certain types of missions: counter-terrorism, unconventional warfare, special reconnaissance, foreign internal defense and direct action. Due to their professionalism and personality traits received after countless successful missions, the productivity of the allied armies has raised. This paper aims to reinforce the fact that American Special Forces has a great contribution on maintaining the global peace, implementing their culture in the military units from all over the world.*

### **18. The American Dream: Live at the Fullest or Die Trying**

**Author:** stud Robert Nicolae STANCIU

**Scientific Advisor:** Assist. prof. Brândușa-Oana, NICULESCU, PhD

**Institution:** “Nicolae Bălcescu” Land Forces Academy of Sibiu

**Abstract:** *The American Dream is a national philosophy or a belief that emphasizes the idea that every inhabitant has the opportunity to fulfil their dreams of having a prosperous and meaningful life. This idea is based on the ideal factors such as democracy, freedom, rights and equality, and offers every citizen equal opportunity to prosper and achieve their setting goals. A key element of the American Dream is the belief that through labour and perseverance, anyone can rise “from rags to riches”, becoming financially successful and socially upwardly mobile. The popularity of this concept spread beyond the borders of the United States of America. The American Dream has brought hope to people's hearts from all around the world. They dream of a rescue from the poor life they have, and also of an upward social*

*mobility for their families, attained through labour in a world with barriers. The American Dream quickly become very popular. It has been used in a lot of movies, TV series, books and it filled the front page of newspapers for a long time. But there is only one problem: is this popular and hopeful concept of the American Dream possible and achievable? Or is it only a joke, a failure for most of the people who take this risk?*

## **19. Research Ships and Their Tales of Discovery**

**Author:** stud Ahmad Kinj SAMER

**Scientific Advisor:** Lecturer Corina SANDIUC, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: Remote exploration in challenging areas of the sea, and across a range of oceanographic disciplines, is becoming increasingly important for us in order to comprehend the complex nature of our seas, to study their various biological characteristics, as well as to predict future changes. Water is well-known for being unstable, so researchers make use of research vessels to find water areas that they need to study, drop anchor, and deploy equipment from. Research cruises do not mean sunny afternoons and cocktails, but tight spaces, few amenities, and long workdays. The aim of this paper is to outline the features of research vessels, according to their many types that serve multiple purposes, and to make a brief overview of their greatest scientific discoveries.*

## **20. Vulnerabilities and Attacks on Computer Systems**

**Author:** stud Cosmin STANCU

**Scientific Advisor:** Florin POSTOLACHE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: Cyberspace generates opportunities to develop the information society, as well as risks to its functioning. The existence of vulnerabilities in computer systems, which can be exploited by organized clusters, makes securing cyberspace a major concern for all the entities involved. Potentially vulnerable to cyber-attacks are not only the physical environment - mobile equipment, computer systems, smartphones, etc., but also logical environment - operating systems, applications, e-mail services, information transfers between companies or cloud operations. The specific objectives of the study are to identify and classify vulnerabilities and risks present in computer systems, to analyze the evolution and structure of cyberattacks, to identify best practices to prevent and mitigate the effects of these attacks, to analyze the public-private cooperation in the field of cybersecurity and to propose cybersecurity policies for harmonizing the*

Romanian regulatory framework with the European recommendations in the field.

## **21. Applications of Graph Theory to Solving Transport Problems**

**Authors:** stud Camelia-Bianca ȘTEFAN, stud. Madalina-Valentina TUDOSE

**Scientific Advisor:** Prof. Dan LASCU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In the problems that arise in mathematics, economics, engineering, in general and in many other areas, there is often a need to represent arbitrary relationships between different objects, respectively of the interconnections between them. For example, given the air routes of a state, it is required to specify the optimal route between two cities. The optimum criterion can be time or price, the optimal path may differ for the two situations. Electrical circuits are other examples in which the interconnections between objects play a central role. The parts (transistors, resistors, capacitors) are interconnected by electrical wires. Such circuits can be represented and processed by a computer system in order to solve simple problems, such as: They are all given parts connected in the same circuit? Or more complicated problems, by type: Is a certain electrical circuit functional? A third example is hosted by activities, including objects are tasks (activities, processes), and the interconnections specify which of the activities must be completed before others. The question to be answered is: When do you need to plan each activity? Data structures that can naturally shape situations such as above are those derived from the mathematical concept known as Graph.*

## **22. Green Energy: a Path to Country Development**

**Author:** stud Andreea-Alina PETRIȘOR

**Scientific Advisor:** Lecturer Camelia ALIBEC, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The world’s population continues to grow at a high rate, therefore today’s population is twice that of 1960, and is projected to increase further to 9 billion by 2050. This means that the percentage of the global energy used in cities is increasing considerably. Green energy is a renewable source of energy and it cannot be depleted. Bioenergy helps stimulate regional economic development and employment by providing new, decentralised and diversified income streams from bioenergy and biomass production. Biomass energy systems offer significant possibilities for reducing greenhouse gas emissions due to their immense potential to replace fossil fuels in energy production. The development of efficient*

*biomass handling technology, improvement of agro-forestry systems and establishment of small and large-scale biomass-based power plants can play a major role in rural development and sustainable utilization of biomass.*

### **23. Ransomware**

**Author:** stud Iuliana-Cătălina AMBROSE

**Scientific Advisor:** Florin POSTOLACHE, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: The project theme presents Ransomware, a computer virus that attacks a user's personal data, as well as various types that start from this virus. The aim of the project is to inform what this virus means, how we can protect ourselves so that our data is not infected with it, but also ways in which the cultilizer improves its protection after infection and how we can recognize different branches. I believe that most people no longer pay attention to similar things and are not aware of the danger they present, some of them not even knowing what happens to them.*

### **24. Matrix Zeros of Polynomials**

**Author:** stud Ionuț BĂLAN

**Scientific Advisor:** Lecturer Anda OLTEANU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: Given a quadratic matrix  $A$  and a polynomial  $p(x)$ , we consider polynomials of matrices,  $p(A)$ . More precisely, we are interested roots of polynomials of matrices with constant coefficients. They are generalizations of polynomials with constant coefficients and they appear for instance in the theorem of Cayley-Hamilton. In this case, the roots are quadratic matrices. We discuss about the shape of these roots, taking into account that the multiplication of matrices is not commutative. We give an analogue of the Theorem of Bezout for this case.*

### **25. Mens Sana in Corpore Sano**

**Authors:** stud Cristian BREABAN, stud. Constantin CRETAN

**Scientific Advisor:** Lecturer Raluca APOSTOL-MATEȘ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract: The present paper's aim is to prove, by personal history, that doing sport is the healthiest way to lead one's life. The authors, from their positions of ex-professional sports players, will explain the importance of excelling in a sport, the personal sacrifices of a profesional sportsman, the feeling of compulsion when personal goals are being reached, and, also, the reasons why not so many professional sports-persons become world-wide famous.*

## **26. The use of SeaSpy2 Magnetometer in the Siutghiol Lake**

**Authors:** stud Codruț-Costin PETRACHE, stud. Ionuț TRIȘCARU

**Scientific Advisors:** Dinu ATODIRESEI, PhD, Andra NEDELUCU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Firstly, this paper contains a brief introduction about the SeaSpy2 magnetometer, but also about where we make the measurements, more precisely the Siutghiol Lake. Secondly, the paper describes the SeaSpy2 magnetometer, as well as how many accessories it has. Then, we will show the types of magnetometers produced using at least two of them at once. Finally, we will present the way the SeaSpy2 operates and some conclusions.*

## **27. Maritime Piracy Nowadays**

**Authors:** stud Denisa CONSTANTIN, stud. Diana IONIȚA

**Scientific Advisor:** Lecturer Raluca APOSTOL-MATEȘ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The present paper’s aim is to share a quick peak into the dangerous field of maritime piracy. The paper is to deal with aspects as: definition of piracy, short history of piracy, nowadays maritime piracy and “hot spots” of piracy on maritime charts.*

## **28. The Truth and Its Various Sides in Media Today**

**Authors:** stud Alessia COSTACHE, stud. Ioana DINU

**Scientific Advisor:** Lecturer Raluca APOSTOL-MATEȘ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The paper deals with the idea that, nowadays, the great influence of social media on people has been increasing. It is very important that many of the news contain a small part of the truth about what is really happening. Unfortunately, many people believe in and adhere to what is being said and shown in the media, being totally unaware of the fact that the truth always depends on the side presenting.*

## **29. Evolution of Passenger Ships**

**Authors:** stud Mihaela COSTACHE, stud. Irina FELINCIOIU

**Scientific Advisor:** Lecturer Raluca APOSTOL-MATEȘ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The present paper deals with the evolution of passenger ships from the early ocean-liners to the “state of the art” passenger ships of today. We will present the evolution in terms of construction, speed, facilities, as well as the biggest passenger ship operating today.*

### **30. The Importance of Lakes in Nature**

**Authors:** stud Cristina-Elena COSTEA, stud. Cătălina-Maria DAN

**Scientific Advisors:** Dinu ATODIRESEI, PhD, Andra NEDELICU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract:* This paper includes information about lakes from the entire world and their importance for the environment. Also, it contains the evolution of lakes from the beginning to nowadays. All lakes fill bowl-shaped depressions on the Earth's surface, called basins. Over the years, lakes have been turned into small holes of water by nature through various processes. Furthermore, this paper highlights the connection between lakes and animals or plants. They serve as migration stops and breeding grounds for many birds and as refuges for a wide variety of other animals. They provide homes for a diversity of organisms, from microscopic plants and animals to fish that may weigh hundreds of kilograms. Therefore, the importance of lakes should be acknowledged by all people and they should be more thankful for this natural wealth.

### **31. Manipulation of the Masses for Recruitment in the Intelligence Services and the Army, in Case of Absolute Necessity**

**Authors:** stud Maria DINU, stud. Aidar-Tolga CIORABAI

**Scientific Advisor:** Mihai SOFONEA, PhD

**Institution:** National Intelligence Academy

*Abstract:* This material aims to highlight the dynamics of the security environment and the ways in which certain entities of force can control the large part of the population by means of internationally recognized techniques as effective but socially inopportune. At the same time, the work itself has the ability to evoke basic meanings of the phenomena that occur in the current geopolitical context and to capture in an objective way the consequences of these actions.

### **32. The False Sense of Liberty-the Dark Web**

**Authors:** stud Darie DOBRICA, stud. George CRISTEA

**Scientific Advisor:** Lecturer Raluca APOSTOL-MATEȘ, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

*Abstract:* The paper deals with the idea that liberty, even being one of the pillars of today's society, can become dangerous by letting itself manifesting. We will try to find the answers to the following questions: "What is the Dark Web?", "What is the purpose of the Dark Web?", "What can you find on the Dark Web?" and "Why is the Dark Web still available to anyone?". The false feeling of liberty one could sense when accessing the



*Web is, in fact, the real feeling of liberty and uncensorship on the Dark Web.*

### **33. Shipwrecks Around the World**

**Author:** stud Marian-Cosmin DRĂGAN

**Scientific Advisor:** Lecturer Camelia ALIBEC, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *There’s something so fascinating about a sunken ship. It’s as if the vessel was frozen in time at the bottom of a body of water, and thanks to popular culture, we think there’s always the chance of finding some sort of treasure down there. According to the National Parks Service, “shipwrecks are an exciting and challenging window into the study and presentation of our past.” Sunken ships are invaluable submerged resources that tell us about what life was like both in the boat’s place of origin, as well as its final destination even if it didn’t actually make it there. By studying sunken ships, underwater archaeologists are able to learn about evolving shipbuilding methods, the people that were sailing, and the products that were coming through the region.*

### **34. Who Said It? - Presidential Speeches Obamaisms vs. Bushisms**

**Author:** stud Ana-Cristina GEICĂ

**Scientific Advisor:** Lecturer Laura CIZER, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *Presidential speeches are one the most important parts of the campaign’s start of every president of the USA. These speeches reveal challenges, hopes, dreams and temperature of the nation. Even in the social media age, the spoken words are more effective than every post on Instagram, Twitter or Facebook. Spoke from the White House as the President is the best way to tell to your people which are your plans and what do you want to do in the next period. In the following paper it will be analyzed how are the presidential speeches in the US and after that I will make a special comparison between Barack Obama and George W. Bush (the 43rd).*

### **35. The Myth of the Past and the Uncertain Future**

**Author:** stud Adriana Raluca IANCU

**Scientific Advisor:** Lecturer Camelia ALIBEC, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *The greatest opportunity for us is to arm ourselves with knowledge. We can use this knowledge to prevent many inconveniences such as environmental disasters. The Deepwater Horizon oil spill was an*

*industrial disaster that began on 20 April 2010, in the Gulf of Mexico on the Macondo Prospect, considered to be the largest marine oil spill in the history of the petroleum industry. This catastrophic event happened in a century in which mistakes are no longer allowed. The evolution of technology and safety at work has been overestimated when we look around us. Therefore, I am going to analyze and present this unpleasant event and its consequences in everyday life.*

### **36. Graphic Applications Using Turtle Module in Python**

**Author:** stud Cristian ȘANDOR

**Scientific Advisor:** Cornelia-Victoria ANGHEL-DRUGĂRIN, PhD

**Institution:** Centrul universitar Babeș-Bolyai Reșita, Universitatea Babeș-Bolyai din Cluj-Napoca

**Abstract:** *Present paper describes the methods of using the turtle module through graphical applications used in the Python programming language. Turtle module is used to draw geometrical shapes in Python, in graphic mode through moving the cursor and it can draw behind him. In object-oriented and procedure-oriented programming, the turtle module provides turtle graphics primitives. It requires a version of Python with Tk support because it utilizes tkinter for the underlying graphics.*

### **37. Factors that Affect Student's Working Environment**

**Authors:** stud Roxana-Mădălina TÎRÎLĂ, stud. Cătălin-Marian ȘERBAN

**Scientific Advisor:** Lecturer Ionel POPA, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *Nowadays, organization are aware of the fact that the student's performance is one of the key factors behind any university's success, which is why the management is usually finding ways to increase the level of students performance through various methods. The study analyzed the influence of workplace environment on student's welfare and productivity. This study aims to investigate the effect of workplace environment's factors towards students' performance. The data has been collected by conducting surveys throughout the semester; a total of 20 students from academy have participated.*

### **38. Piracy Vs. Terrorism**

**Authors:** stud Alex VIRTAN, stud. Nicolaos SAMOLIS

**Scientific Advisor:** Lecturer Raluca APOSTOL-MATEȘ, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *The present paper's aim is to present Piracy and Terrorism as different and interconnected concepts. We will deal with aspects such as:*

*what is the relationship with the victims, how are the ships or the persons "captured", what is the mobile of the capture, different legal aspects.*

### **39. Autocad and the Geometry of the ship - an Example of Its Use**

**Authors:** stud Gabriel ZAMAN, stud. Andreea BUTNARIU

**Scientific Advisor:** Mihaela-Greti MANEA, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *The work proposes a way to represent the geometry of the ship, in three projections, using the facilities provided by AutoCAD as an advanced graphical tool. The idea of the work was based on the desire to apply the knowledge and drawing skills acquired to the design and Infoographic discipline, to the specialty disciplines that target the hull of the ship. The work shows the geometry of the vessel in both 2D and a three-dimensional representation. The usefulness of the work is that the three-dimensional representation allows a student who is just starting in the field of marine architecture to better understand the complex construction forms of the hull.*

### **40. Applications of Graph Theory to Solving Transport Problems**

**Authors:** stud Camelia-Bianca ȘTEFAN, stud. Madalina-Valentina TUDOSE

**Scientific Advisor:** Eleanora RĂPEANU, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *In our project you can see how mathematics evolved from prehistoric times to the 21st century. Mathematics has been, is and will continue to be a part of our lives as human beings. Although it all started with a simple bone, today mathematics has evolved in various branches, such as: mathematical logic, mathematical analysis, algebra, geometry, etc. We chose the topic: "The History of Mathematics from Antiquity to the Present" because mathematics has been important since prehistoric times. We believe that mathematics is a science of thinking and we believe that those who think the most become the most important mathematicians, such as Srinivasa Ramanujan, who is the most important mathematician of the 20th century, Grigori Perelman, who in 2003 solves one of the problems of the millennium etc. Like humans, computers have become more important in mathematics, they are more efficient at finding a quick mathematical answer. We set out to present a short history of our mathematics, which today enjoys a real success, which has also become a profession. Thus, starting from the notion of number and going through all the periods of antiquity in order to know a little more about the subject of "mathematics".*

#### **41. Economic Impact of Shipping Industry**

**Author:** stud Marian-Drăguțu VÎNĂ

**Scientific Advisor:** -

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

***Abstract:** The main idea of the project includes the economic value of shipping and maritime transportation activity in Europe and in the rest of the world, the estimation of the direct and indirect economic impact on the shipping industry, through its European supply chain, and through the spending of workers and those in the supply chain. For growth and sustainable development, cost efficient mechanisms of shipping are followed, especially in the developing world. Maritime transport is one of the main activities of the blue economy, which plays an important role in the EU. Maritime shipping is the fundamental part of the world trade. Many industries are associated with it. Shipping is used to transport food, medicines, technology equipment and so on and so forth.*

#### **42. The chemistry of Effective Management of Wastewater. Study of Case: Black Sea**

**Author:** stud Vlad-Mihai CHELU

**Scientific Advisor:** Manuela Rossemary APETROAELI, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

***Abstract:** The correct and effective management of wastewater aboard is an increasing important part of life at sea as people realise more and more the importance of environment protection. Wastewater generated by processes at sea can be categorised in two main categories: blackwater which denotes wastewater from toilets, very dangerous most of all because it contains pathogens and greywater which comes from dishwashers, baths, sinks and other sources and contains fewer pathogens and is generally safer to be handled and treated. Environment protection implies good and careful handling and treatment aboard of wastes generated by the crew's activity in full according with current laws (Annex IV MARPOL) and good practice. Moreover, the most important of all is the prevention of generating pollution by using innovative technologies and means. This paper's study of case is about the Black Sea, one of the most circulated and a result of polluted seas of Europe. Its objective is to highlight the current statistics regarding pollution caused by ship traffic, discussing the past, present and, mainly, the future of this wonderful sea's environment.*

#### **43. Description of the Ground Magnetic Field Configuration for the NV Area of the Black Sea**

**Authors:** stud. Maria CATRINA, stud. Iulia LUP

**Scientific Advisor:** Andra NEDELCU, PhD

**Institution:** "Mircea cel Batran" Naval Academy, Constanta

**Abstract:** *The paper entitled "Description of the ground magnetic field configuration for the NV area of the Black Sea", aims at precisely identifying the magnetic field configuration that appeared in the North-West Black Sea area. In order to carry out this analysis, the work has been structured into three important chapters. The first chapter, "Appearance of magnetic field on earth", highlights how magnetism was first discovered. Its discovery was followed by full studies on the phenomenon of magnetization. In the second chapter, "Black Sea magnetic field", the work focuses on analysis of the Black Sea magnetic field and of the magnetic anomalies that have occurred in this area. The latter chapter, the "Magnetic mapping of the west of the Black Sea", enters the detailed description of the North-West Black Sea area, more precisely, the way in which the mapping of this area was realised.*

#### **44. The Impact of Meteorological Phenomena on Aviation Activities**

**Author:** stud Iulia-Anisia DINU

**Scientific Advisor:** Sorin CHEVAL, PhD

**Institution:** „Henri Coanda” Air Force Academy, Braşov

**Abstract:** *The purpose of this article is to assess the influence of meteorological events on aviation activity. Dew, rime, glazed frost, visibility related to fog and precipitation, clouds, and thunderstorms are all covered in this essay. Many factors can affect the safety of a flight and its crew, but the features and behavior of the Earth's atmosphere are thought to be the most unexpected and powerful. From strong winds to thunderstorms, understanding extreme weather phenomena and their repercussions is critical in order to make the best decisions and avoid air mishaps, as there is no method that can accurately anticipate meteorological parameters over short or long time periods.*

#### **45. The Influence of Stress on the Performance of air Traffic Controllers in Aviation**

**Author:** stud Marian Cornel BARBU

**Scientific Advisor:** Mihaela GURANDA, PhD

**Institution:** „Henri Coanda” Air Force Academy, Braşov

**Abstract:** *Within the world of aviation, the air traffic safety could be heavily threatened by numerous errors which could result from the accomplishment of complex and pressurising tasks by the air traffic controllers. The high degree of stress with which the air traffic controllers have to deal could get overwhelming at times, therefore accidents are inevitable. This paper*

*addresses this topic and discusses the main effects of the stress on the people working in this field, based on articles and literature findings. Furthermore, it covers reflections which allow for a deeper understanding of this subject and the ways in which these errors can be avoided by the air traffic controllers. It summarises the current state-of-the-art regarding “The influence of stress on the performance of air traffic controllers in aviation”.*

#### **46. Pilot-Specific Cognitive Skills**

**Author:** stud Mihai Vlad MATEI

**Scientific Advisor:** Mihaela GURANDA, PhD

**Institution:** „Henri Coanda” Air Force Academy, Braşov

**Abstract:** *Piloting an aircraft is a complex activity from a cognitive and behavioral point of view. The cognitive skills developed by military pilots are organized systems of psychic processes that ensure performance during flight, while representing the instrumental-operational side of the personality that allows the successful completion of all tasks in the cockpit of the aircraft. In addition to skills, the successful completion of piloting tasks is conditioned by aeronautical knowledge and skills, interests and attitudes.*

#### **47. The Role of Emotions in the Workplace**

**Author:** stud Mihaita Daniel DIBURICA

**Scientific Advisor:** Mihaela GURANDA, PhD

**Institution:** „Henri Coanda” Air Force Academy, Braşov

**Abstract:** *The purpose of this paper is to understand the impact of emotions and their management in the workplace and their daily lives. The subject behavior is determined by emotions, which can be triggered by interactions, internal or external stimuli, and patterns. These patterns are represented by a natural ‘programming system’ developed in childhood due to emotional episodes which happened to be negative for the subject. When it is triggered, the pattern activates and the subject behaves accordingly without questioning it and thus, workplace performance and efficiency will suffer. At the end of the day, without emotional management, the subject will feel exhausted, maybe still triggered, blocked into a pattern. Managing these emotions will bring an improvement to subject performance at work. Therefore, the author suggests a simple method of managing one’s emotions, self-coaching. The method is based on four simple questions which will reduce the perceived pressure and stress. In turn, successfully applying this method will improve a subject’s performance and efficiency in the workplace*

#### **48. Relationships Between Piloting Technique and Pilot Attitudes**

**Author:** stud Ștefan NEDELCU

**Scientific Advisor:** Mihaela GURANDA, PhD

**Institution:** „Henri Coanda” Air Force Academy, Brașov

**Abstract:** *This paper addresses how the attitude of the pilot can change his piloting technique and is based on the study of social psychology and how people develop their attitude. Through my research I aim to demonstrate that attitude can even have a direct impact on piloting technique. I am doing this research because it is important for aviators to know this side because it produces unconscious changes in their professional activity. The objectives of the research are to prevent and combat attitudes that may affect flight safety. The method I am abording to accomplish this goal is to research existing scientific sources.*

#### **49. The Effects of Technostress in the Pilot’s Career**

**Author:** stud Mihai-Laurențiu SANDU

**Scientific Advisor:** Mihaela GURANDA, PhD

**Institution:** „Henri Coanda” Air Force Academy, Brașov

**Abstract:** *In this paper, I will point out the positive and negative effects of technology stress in the career of pilots, highlighting their skills and performance during the flight, from where to result methods to combat technostress. It is important to know our limits but it is effective to know how to neutralize their effects.*

#### **50. Study on the Influence of Wind Shear in Aeronautical Activity**

**Author:** stud Alexandra SOFEI

**Scientific Advisor:** Sorin CHEVAL, PhD

**Institution:** „Henri Coanda” Air Force Academy, Brașov

**Abstract:** *Shear wind is a meteorological phenomenon that can greatly influence both the direction and speed of aircraft during flight. In this paper I have chosen to study how it occurs and to what extent it can influence both performance and aviation safety. In addition to these aspects, we analyzed the way in which the presence of shear wind is reported and the measures that can be employed to avoid incidents or accidents.*

#### **51. Inner Workings of Submarines**

**Author:** stud Gheorghe-Andrei PERIANU

**Scientific Advisor:** Associate Professor Alina BALAGIU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *This presentation will cover what submarines are and how they function. Submarines work by utilizing the force known as buoyancy. They*

*are fitted with large tanks that can fill with water and air, allowing the vessel to dive and surface. I will explain the design of the tanks and the processes involved in its functionality. The presentation will also cover the various processes that are needed in order to sustain the life of the crew for long periods underwater. Various types of submarines will be presented among which research submarines and narcos.*

## **52. Submarine Warfare**

**Author:** stud Nicolae-Rareş LUPAN

**Scientific Advisor:** Associate Professor Alina BALAGIU, PhD

**Institution:** “Mircea cel Batran” Naval Academy, Constanta

**Abstract:** *In this presentation I am going to talk about how submarines were used in warfare. I present the role of the submarines in the First and the Second World Wars, mainly how they were used and their armament. I will present the Battle of the Atlantic and the Pacific Theater. Different types of submarines of different nations will be analyzed. The way of operation, the armament and the benefits of using submarines in deep sea warfare will be highlighted.*