Lod 11 "International Naval Semester"

"EQF 7 LEARNING OUTCOMES" (Version 4 - Revision)

A. NON-COMMON MODULES

NAVAL LEADERSHIP (2 ECTS)		
KNOWLEDGE	**SKILLS**	**RESPONSABILITY**
• Knowledge on Self and Team leadership. • Developing professional communication abilities, both orally and in writing, including negotiation and mediation techniques, and the necessary terminologies allowing him/her to express opinion, arguments, orders and feedbacks in an appropriate manner	• Carries out tasks in accordance with specified objectives, being integrated in a work group and allocates specific tasks to subordinate levels using communication and dialog, co-operation, positive thinking and mutual respect and using feedback to improve personal activity. • Develops interpersonal communication skills and cultural open mindedness within a group in situations of work or in an external and complex environment (transmitting opinions, orders, feedbacks, etc.).	• Demonstrates ability to optimize human potential like steadiness, determination, work anticipation, organization, sense of liability and integrates genderawareness in his/her decisions. • Assumes responsibilities of the leader, based on modern means of Leadership in complex military operations • Communicate and interact effectively in an international environment.
POWER PLANTS (3 ECTS)		
KNOWLEDGE	**SKILLS**	**RESPONSABILITY**
• Knowledge of Fluid and Gas Dynamics. • Draw layouts of operation within the electric circuit. • Envision distribution of electricity and management of individual power systems high and low voltage. • Provide load distribution in the ship's power network. • Discern and describe the processes, elements and performance of marine propulsion systems.	• Ability to manage different types of engines, propellers (F.P. – C.P.P.). • Ability to calculate engines fuel consumption per hour for different speeds. • Ability to manage the connecting systems (shaft, gearbox, clutch). • Ability to understand the effects of Marpol Annex VI about the performance of the propulsion plant.	• Manage propulsion plants in different scenarios. • Manage propulsion plants to obtain the best performance in relation with the mission.

• Analyse and describe the function of system pipeline and equipment necessary for safe navigation.	• Ability to be the energy manager for the electrical network	
COMPUTER NETWORK (2 ECTS)		
KNOWLEDGE	**SKILLS**	**RESPONSABILITY**
• Knowledge of the data representation and storage, data processing, computer architecture, operating systems, networks, internet. • Carry out training on the application context (Operating Systems, Server, Mobile, Firmware and Safety aspects. • Knowledge of Networks and protocols (ISO/OSI model, Focus on Ethernet and IP networks). • Understand the IT application systems like Client Systems, Service Oriented Applications, Databases, Cloud computing. • Understand the OT application systems like Protocols and Architectures, PLC and microcontrollers, Supervisory systems.	• Understand the complex principles, structure and security aspects of communication Networks. • Identify the complex functions such as addressing, routing, and firewalling for IP networks.	• Ability to configure simple and complex IP services. • Ability to define IP rules for firewalls and routers. • Record network traffic with Wireshark.
NAVAL ELECTRONICS (3 ECTS)		
KNOWLEDGE	**SKILLS**	**RESPONSABILITY**
• Acquire the scientific knowledge, necessary for understanding the operating principles of the on-board electronic equipment: – Discrete Analog Electronics – Power Electronics – Digital Electronic Circuits – VLSI Circuits via theoretical and laboratory training.	• Have knowledge about electronic devices principles. • Interpret correctly the physic phenomena of static and dynamic electronic devices functionality. • Be able to identify and determine the main parameters and create static characteristics of electronic devices. • Achieve knowledge about electronic circuit projection.	• Ability to understand and analyze electronic circuits making use of different types of amplifiers and active elements. • Ability to correctly understand and analyze the polarization of electronic circuits. • Ability to analyze and understand the behavior of electronic circuits.
Note: Basic knowledge of digital and analog electronic circuits is recommended for attendees.		

NAVAL SENSORS - *(PREREQ NAVAL ELECTRONICS)* (3 ECTS)		
KNOWLEDGE	**SKILLS**	**RESPONSABILITY**
• Understand the principles of radar, radar equipment (transmitters, antennae, receivers, etc.). • Review of Military Radar Applications with practical case studies (Synthetic Aperture Radar, Multistatic radar, Over the Horizon Radar, Phase Array Radar). • Understand radar equations and radar performance with Probabilities of Detection and False Alarm as parameters. • Description and analysis of the operation and performance of military radar systems for detecting, tracking and locking on targets in the aeronautical operational area. • Knowledge of the electronic warfare. • Review of principles and applications of Electrooptical Systems as key sensors in the Aeronautical Warfare. • Knowledge of the electronic warfare in ES,EP and EA Systems	• Recognize the constructive type of equipment and integrated navigation system by various specific criteria. • Describe and identify the parts of integrated bridge systems of the ship. • Interpret and correlate the provided data by the integrated bridge systems.	• Understand different techniques applied to modern sensors. • Ability to evaluate sensors main performances and cost. • Ability to make correct tactical decisions exploiting information from radars and EW systems. • Manage on-board sensors in different warfare and scenarios. • Take advantage of the maximum potential of onboard sensors, also in relation to the operational environment.
Note: Basic knowledge on radar and optoelectronic systems is recommended for attendees.		

MARITIME SECURITY AND NCAGS (2 ECTS)		
KNOWLEDGE	**SKILLS**	**RESPONSABILITY**
• Knows the EU and international maritime Security Law. • Knows the main aspects of modern maritime warfare and rules of engagement. • Has a basic knowledge on maritime security theories. • Has a basic understanding of the EU maritime strategy. • Know the naval cooperation and guidance for shipping (NCGS) operations.	• Finds a suitable solution in a complex and potentially dangerous maritime environment, to find a tactical solution to complete the mission. • Has the necessary administrative skills for managing multinational naval incidents. • Manages stress situations, combining on the spot	• Understands the course of action of the higher command level and takes the necessary initiative to contribute to its success. • Can make decisions in an unpredictable operating naval environment. • Adapts to various types of conflicts, naval actions based on acquired knowledge.

	decisions and respect to the maritime law.	
NAVAL CYBER THREATS - *(PREREQ COMPUTER NETWORKS)* **(3 ECTS)**		
KNOWLEDGE	**SKILLS**	**RESPONSABILITY**
• Knowledge of Information security, security of communications and data Encryption, Hashing, Authentication and digital signature, secure network architectures (Wired networks and wireless networks, IT networks, OT networks). • Knowledge of Systems evaluation techniques. • Vulnerability and methodologies of attack. • Risk Assessment and Management (IT vs OT, Multidimensional threat, Vulnerability Assessment, Penetration Test). • Network control methods (Logging, monitoring and analysis, IDS and Data Analysis Techniques, near real-time security and communications). • Basic knowledge of cyber-attacks: malwares, information-based attacks and their attacking methods. • Understand the complex cyber security. • Understand the principles of international/ national cyber security strategies.	• Recognize threats for confidentiality, integrity and availability in IT and OT systems. • Identify risks for IT/OT networks and common applications. • Understand principles on service/business continuity and recovery plans. • Identify the cyber threats. • Describe the cyber-attacks: fundamentals of malwares, informationbased attacks and their attacking methods. • Identify the task and tools to improve of personal and organizational cyber security.	• Ability to use secure communications such as SSL and tools for digital signature and encryption. • Ability to identify Vulnerability on a common source Database (CVE). • Ability to evaluate Risk Assessments and VA&PT reports. • Ability to read and understand incident reports. • Ability to realize the cyber threats. • Ability to set up cyber security defences. • Consider the possibilities to develop cyber security capabilities. • Ability to manage Naval networks
OCEANOGRAPHY (2 ECTS)		
KNOWLEDGE	**SKILLS**	**RESPONSABILITY**
• Knowledge of the main topics of general and military oceanography. • Understand the Oceanographic Weather	• Enhancing capabilities in navigation, hydrography and ship manoeuvring at the operational level; • Planning route, executing navigational watch in safe	• Collect and manipulate oceanic, atmospheric, and geospatial data sets and rigorously analyse and interpret observational data, in situ experimental data, and model results. • Analyse and interpret flow of

Organization (METOC) within NATO.	conditions and ship management in order to ensure a good seaworthiness of the ship, even the ship is alone or in a task group or task force.	operational METOC data, in naval military operations.
NAVAL ARCHITECTURE (4 ECTS)		
KNOWLEDGE	**SKILLS**	**RESPONSABILITY**
• Knowledge of geometry, static and dynamics law of the ship, necessary to face the problems connected with the buoyancy, the stability, the resistance to advancement and the behaviour of the ship.	• Apply correctly the studied topics about ship geometry, ship forms, ship buoyancy, intact and damaged ship stability. • Recognise and describe shipbuilding elements and the main ship building methods. • Describe special ship features of shipbuilding and operation. • Understand and analyse the ship's hull longitudinal strength. • Operate safely the transport vessels while loading or unloading cargo. • Use ship's documents and diagrams referring to hydrodynamics and ship stability. • Understand and correctly apply seakeeping concept and principles.	• Ability to evaluate variation of stability caused by changing boarding cargo or flooding. • Ability to analyse effect of the trim about the ship's stability.
Note: Knowledge of basic physics and basic mathematics is recommended for attendees.		
NAVAL COMMUNICATIONS (2 ECTS)		
KNOWLEDGE	**SKILLS**	**RESPONSABILITY**
• Knowledge of characteristics of radio-communication systems and devices. • Understand electromagnetic wave phenomena, propagation and attenuation. • Knowledge of free-space propagation.	• Achieve knowledge about maritime communications, electromagnetic waves propagation, communications types and modulation. • Knowing how to organize a frequency plan taking into consideration the skills and restrictions of naval training.	• Recognize the main communication problems, solving them. • Prepare the naval force communication plan. • Transmit and receive correct and in time information, using GMDSS subsystems and equipment in accordance to Radio Legislation and

• Understand the principles of modulation and satellite communications. • Satellite systems for telecommunications, navigation, remote sensing and maritime security systems are examined, orbital mechanics and link budgets of GEO, MEO and LEO Satellites. • Basic knowledge of the GMDSS systems.	• Know the best propagation methodologies depending on the time of day and the frequency bands used. • Know the principles of satellite communications and the associated multiple access techniques to the satellite resource. • Achieve GMDSS knowledge according to Radio Legislation and subsystems technique specifications.	other conventions and international regulations (SOLAS, STCW, etc.).

B. COMMON MODULES

MILITARY LEADERSHIP C (PHYSICAL TRAINING) (3 ECTS)		
KNOWLEDGE	**SKILLS**	**RESPONSABILITY**
• Knows the main aspects of general and specific sports education and is subsequently able to organize physical training sessions for subordinated personnel. • Has a basic knowledge on maintenance of physical fitness and how to pass this knowledge theoretically and practically to subordinated personnel as a leader. • Knows the techniques to prepare and conduct physical training sessions. • Knows the basic methods of prevention of injuries and overload damages.	• Is capable of managing physical training sessions using different methods of training. • Has the necessary organizational and administrative skills for managing physical training mainly for fitness military personnel needs. • Is able to lead a group during physical training	• Is capable of leading physical training sessions. • Assumes responsibilities of the leader for physical training, based on modern means of training methods. • Maintains and develops the physical fitness that is required for enduring situations a military leader must face.
CSDP – Common Security and Defense Policy (2 ECTS)		
KNOWLEDGE	**SKILLS**	**RESPONSABILITY**
• Is aware of needing for Europeanisation of officer training. • Knows basics of EU history and institutions. • Knows basics of CFSP, CSDP, ESS, and EUGS.	• Is able to apply CSDP-knowledge and develop creative solutions within a specialised CSDP-field to solve simple, complex, or unpredictable problems.	• Solves problems tasked during syndicate work and performs activities and roles specific in accordance with different level of responsibility.

• Knows basics of civilian and military crisis management, capability development, and integrated approach. • Knows basics of EU missions and operations, EU and partners, regional aspects and neighbourhood policy. • Is aware of horizontal issues related to CSDP (human rights, gender mainstreaming and legal aspects) and the way ahead (future perspectives).	• Is able to deal with people in learning and working communities.	• Is capable of making decisions in coherence with CSDP principles and procedures and EU values.

Non-common modules
Common modules