FACULTY OF MARITIME STUDIES – UNIVERSITY OF SPLIT
TRAINING CENTRE

INFORMATIONS FOR ALL COURSES ARE AVALIABLE ON THE FACULTY WEB – EDUCATION FOR SEAMAN –TRAINING CENTRE:

Ruđera Boškovića 37,
21000 Split, Croatia
Web: www.pfst.unist.hr

Dekanat: +385(0)21 619 402
Tel.: +385(0)21 619 399
Fax: +385(0)21 619 499

IBAN: HR2324070001100059179
OIB: 24624257529

https://www.pfst.unist.hr/hr/edukacija-pomoraca/trening-centar

STATUS OF IMO MODEL COURSES AS AT March 2021.

IMO MODEL COURSE	STCW MARK	COURSE CODE	COURSE DESCRIPTION - COURSE TITLE	DURATION IN HOURS		Total days/hrs	Note
				THEORY	PRACTICE		
1.07	A II/1, B/1-12	D6B	RADAR NAVIGATION, RADAR PLOTTING AND USE OF ARPA Radar Navigation - Operational Level	17	33	5 days – 50 hrs	-
1.08	A-II/2	D6C	RADAR, ARPA, BRIDGE, TEAMWORK AND SEARCH AND RESCUE - Management Level	8	22	3 days – 30 hrs	-
1.25	IV/2-3	D11	General Operator's for GMDSS	46	49	10 day – 95 hrs	-
1.01	A-V/1, A-I/12, A-V/1-1-1	D13A	TANKER FAMILIARIZATION (Basic training for oil and chemical tanker cargo operations)	40	7	5 days – 47 hrs	-
1.01	A-I/12, A-V/1-2-1 B-I/12.40	D13B	TANKER FAMILIARIZATION (Liquefied Natural Gas (LNG) Simulator course)	29	4	4 days – 33 hrs	-
1.02	A-V/1-1-2 B-I/12.40	D14	SPECIALIZED TRAINING FOR OIL TANKERS (Advanced training for oil tanker cargo operations)	46	14	6 days – 60 hrs	-

1.03 1.04	A-V/1-2-2 A-V/1-2-3 A-V/1-2-2	D15	SPECIALIZED TRAINING FOR LIQUEFIED GAS TANKERS (Advanced training for liquefied gas tanker cargo operations)	46	14	6 days – 60 hrs	-
1.04 1.05 1.06	A-V/1-2-3 A-V/1-1-3	D16	SPECIALIZED TRAINING FOR CHEMICAL TANKERS (Advanced training for chemical tanker cargo operations)	46	14	6 days – 60 hrs	-

1.13 1.14	VI/4-1	D19	MEDICAL FIRST AID	12,25	8,75	3 days – 21	-
1.15	VI/4-2	D20	ADVANCED MEDICAL CARE	33,5	11,5	5 days – 45 hrs	-
1.28	V/3-1, 2, 3	D21-D26	PASSENGER SAFETY MEASURES	18	9	3 days – 27 hrs	For Officers
1.28	V/3-1, 2, 3	D21-D26	PASSENGER SAFETY MEASURES	10	7	2 days – 17 hrs	For Crew
1.10	B-V/4,5, B-V/b, B-V/c	D27	DANGEROUS CARGO HANDLING	15	13	3 days – 28 hrs	-
3.19	A-VI/5 A/2-1-6, A/12-1 A/12-2 ISPS Code	D32	Ship Security Officer – SSO	15	1	2 days – 16 hrs	-
3.27	VI/6-1	D42	Security Awareness Training for All Seafarers	4	2	1 day – 6 hrs	-
3.26	VI/6-2	D43	Security Training for Seafarers with Designated Security Duties	7	2	1 day – 9 hrs	-

1.27	A-II/1, A-II/2	D44	ECDIS - OPERATIONAL USE OF ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEMS	24	16	4 days – 40 hrs	-
1.22	A-II/1, A-II/1&2, B-VII/2-5 B-VIII/2	D45	BRIDGE RESOURCE MANAGEMENT	12	8	2 days – 20 hrs	-
2.07 1.22	A-I/2, A-III/1&2 A&B-VIII/2	D46	ENGINE ROOM RESOURCE MANAGEMENT	12	8	2 days – 20 hrs	-
1.21 1.22 1.23 1.39	A-II/1, A-II/2-6 A-III/1, A-III/6	D47A	Human Element, Leadership and Management at the Operation Level	12	8	2 days – 20 hrs	-
1.21 1.22 1.23 1.39	A-II/2-6 A-III/2	D47B	Human Element, Leadership and Management at the Management Level	12	8	2 days – 20 hrs	-
1.38	A-II/1, A-III/1, A-III/6	D48	MARINE ENVIRONMENTAL AWARENESS	6	2	1 day – 8 hrs	-
	A-III/1	D49A	HIGH VOLTAGE COURSE - OPERATION LEVEL	3	2	1 day – 5 hrs	-
	A-III/2 A-III/3	D49B	HIGH VOLTAGE - MANAGEMENT LEVEL	12	10	3 days – 22 hrs	-

			SHIP HANDLING	THEORY	PRACTICE	Total days/hrs	Note
1.22, 1.32	A-II/1,2-9 Reg.I/12, A-VIII/2, B-V/a B-V/2,3 B-I/12 B-VIII/2	PODDOL	Ship Handling Simulator Ship Handling when using marine azimuthing control device (AZIPOD) Training - (Operation Level) Course Certified by Bureau Veritas	12	12	3 days – 24 hrs	-
1.22, 1.32	A-II/1,2-9, Reg. I/12, B – V/2,3, B-I/12, B-VIII/2	PODDML	Ship Handling Simulator Ship Handling when using marine azimuthing control device (AZIPOD) Training - (Management Level) Course Certified by Bureau Veritas	20	20	4 days – 40 hrs	-
1.22, 1.32	A-II/1,2-9, Reg. I/12, B – V/2,3, B-I/12, B-VIII/2	SHMLNG	Ship Handling Large Liquid Natural Gas Carrier (LNG) Simulator Ship Handling and Maneuvering Course Certified by Bureau Veritas	20	20	4 days – 40 hrs	-
1.22, 1.32	A-II/1,2-9, Reg. I/12, B – V/2,3, B-I/12, B-VIII/2	SHM-VLCC	Ship Handling Very Large Crude Carrier (VLCC) Simulator Ship Handling and Maneuvering Course Certified by Bureau Veritas	20	20	4 days – 40 hrs	-

1.22, 1.32	A-II/1,2-9, Reg. I/12, B – V/2,3, B-I/12, B-VIII/2	SHM-VLCV	Ship Handling Very Large Container Vessel (VLCV) Simulator Ship Handling and Maneuvering Course Certified by Bureau Veritas	20	20	4 days – 40 hrs	-
1.22, 1.32	A-II/1,2-9, Reg. I/12, B – V/2,3, B-I/12, B-VIII/2	SHMPCC	Ship Handling Pure Car Carrier (PCC) Simulator Ship Handling and Maneuvering Course Certified by Bureau Veritas	20	20	4 days – 40 hrs	-
1.22, 1.32	A-II/1,2-9, Reg. I/12, B – V/2,3, B-I/12, B-VIII/2	SHM-NC	Ship Handling Simulator Ship Handling and Maneuvering in Narrow Chanel Course Certified by Bureau Veritas	20	20	4 days – 40 hrs	-
1.22, 1.32	A-II/1,2-9, Reg. I/12, B – V/2,3, B-I/12, B-VIII/2 IMO resolution A.960(23)	SHMHTB	Ship Handling Simulator Ship handling with Harbour Tug Boat assistance Training Course Certified by Bureau Veritas	20	20	4 days – 40 hrs	-

1.22, 1.32	A-II/1,2-9 Reg.I/12, B-V/2,3 B-I/12 B-VIII/2	STS	SHIP TO SHIP (STS) TRAINING Course Certified by Bureau Veritas	20	20	4 days – 40 hrs	-
IMO Polar Code	A-I/II, 14, A-V/4-1, B-I/2	ICE NAV-OL	NAVIGATION IN ICE – Operational Level (Basic) Course Certified by Bureau Veritas	26	8	------	In process of obtaining
IMO Polar Code	A-I/II, 14, A-V/4-2, B-I/2	ICE NAV-ML	NAVIGATION IN ICE – Management Level (Advanced) Course Certified by Bureau Veritas	16	14	------	In process of obtaining

1.21 1.22 1.29 1.39	A-II/1-6 A-III/1,2,6	MCRM	MARITIME CREW (HUMAN) RESOURCE MANAGEMENT (Developed and Certified by Oxford Aviation Academy)	20	20	4 days – 40 hrs	-

1.22 1.29 1.39	ISO Standard	SIMC	SHIP MANAGEMENT IN CRISIS	16	0	2 days – 16 hrs	-

1.22	A-II/1 A-II/2/ A-III/1 A-III/2	SSBT	SHIP BRIDGE SIMULATOR AND BRIDGE TEAMWORK	20	20	4 days – 40 hrs	-
1.34	A-II & A-III	AIS/VDA	AUTOMATIC IDENTIFICATION SYSTEMS (AIS) & VOYAGE DATA RECORDER (VDA)	5	5	1 day – 10 hrs	-

2.07	B-VIII/2	ERSETW	ENGINE ROOM SHIP SIMULATOR AND ENGINE TEAMWORK	20	20	4 days – 40 hrs	-
3.11	A-II/2, A-III/3	SBSO	SHIPBOARD SAFETY OFFICER (Safe Working practice as per MCA)	18	0	2 days – 18 hrs	-
3.11	IMO A 849 (20) &. A 884 (21)	MRMAIIA	MARITIME RISK MANAGEMENT, ASSESMENT AND MARINE INCIDENT INVESTIGATION & ANALYSIS (ISM Code Clauses 1.2, 8, 9, 12)	16	0	2 days – 16 hrs	-
		MAR	MARLINS ENGLISH LANGUAGE TEST & TOSE	10	-	1 day	-
		AED	AUTOMATIC EXTERNAL DEFIBRILLATOR (AED)	2	2	½ day – 4 hrs	-
IMO Resolution IMO Guidelines	A.1050(27) MSC.1/Circ. 1401	TI	TANK INSPECTION	12	4	2 days – 16 hrs	-

		EEFM	ENERGY EFFICIENCY (CONSERVATION) AND FUEL MANAGEMENT	16	0	2 days – 16 hrs	-
	BMP5 Jun. 2018.	AP	ANTI-PIRACY	10	0	1 day – 10 hrs	-
1.01, 1,02, 1,03, 1.04, 1.05, 1.06,	A-V/1-1-2 B-I/12.40	LCHSI M-OIL	LIQUID CARGO HADNLING SIMULATOR (OIL) LCHS-5000	20	20	4 days – 40 hrs	-
1.01, 1,02, 1,03, 1.04, 1.05, 1.06,	A-V/1-2-2 A-V/1-2-3 A-V/1-2-2	LCHSI M-GAS	LIQUID CARGO HADNLING SIMULATOR (GAS) LCHS-5000	20	20	4 days – 40 hrs	-

YELLOW HIGHLIGHTED –	Training courses approved by Ministry of Maritime Affairs, Transport and Infrastructure of Republic of Croatia
LIGHT BLUE HIGHLIGHTED –	Training courses certified by Bureau Veritas (BV)
GREY HIGHLIGHTED –	Different Tanker training courses (Certificated by Ministry of Maritime Affairs, Transport and Infrastructure, Republic of Croatia in process)

IMPOTANT NOTES:

- **MINIMUM NUMBER OF CANDIDATES ≡ FOUR (4) CANDIDATES PER EACH COURSE;**
- MAXIMUM NUMBER OF CANDIDATES (depending of type of training) ≡ TEN (10) to TWELWE (12) for ordinary classroom courses and max. 5 – 6 candidates for Simulator training Courses usually;

- The courses are conducted in Croatian or English and according to the agreement/request of the interested client; All Courses organized by Faculty of Maritime Studies Split and Maritime Research Centre Split;
- **VAT** included in Course Fee;
- EUR at the HNB middle exchange rate on the day of conversion and that prices may fluctuate depending on the market situation.
- Faculty of Maritime Studies Split can also organize any other ***specific or refreshment*** course or training at any time and in accordance with customer request and market needs.
- **Final price i.e. discount for each Course depends on final number of Candidates.**

Split, 2024.

➢ *Faculty Equipment*

Department of ***Nautical Engineering*** carefully and continuously follows the trends on the global maritime market and the requirements that are set in the education of seafarers. Accordingly, investments are made in the research and teaching tools and equipment, and particular attention is paid on the cooperation with other scientific institutions, state administration and relevant industry partners. In terms of equipment modernisation, it is especially worth pointing out that the transfer of the Faculty premises into the new building on the Campus in 2015/2016 has enabled a considerable material and technical breakthrough as well as the realisation of many new projects.

The facilities and equipment of the Nautical Engineering Department comprises a number of workshops, simulators and practicums, including:

- Two navigation simulators (*Transas*), of which the larger one meets the standard of DNV *class A* (300°) and is fitted with the DP simulator
- ECDIS/ARPA workshop with 10 work stations, i.e. 10 mini bridges
- Marine GMDSS console *Raytheon* – Standard radio/Skanti GMDSS simulator *Poseidon* with 4 work stations
- GMDSS simulator (*Transas*) with 10 stations
- Liquid cargo handling simulator with 4 work stations
- MACS 3 simulator for handling dry bulk cargoes, featuring 5 work stations
- VTS simulator
- Station for modelling the areas and ships for – Model *Wizard* for NTpro 5000
- Simulator for oil pollution of the marine environment (*Transas – Pisces II*)
- Nautical workshop with 46 work places (and dedicated computers)
- Safety workshop
- Meteorology workshop
- Planetarium equipment.

➢ ***Nautical Engineering equipment photos:***

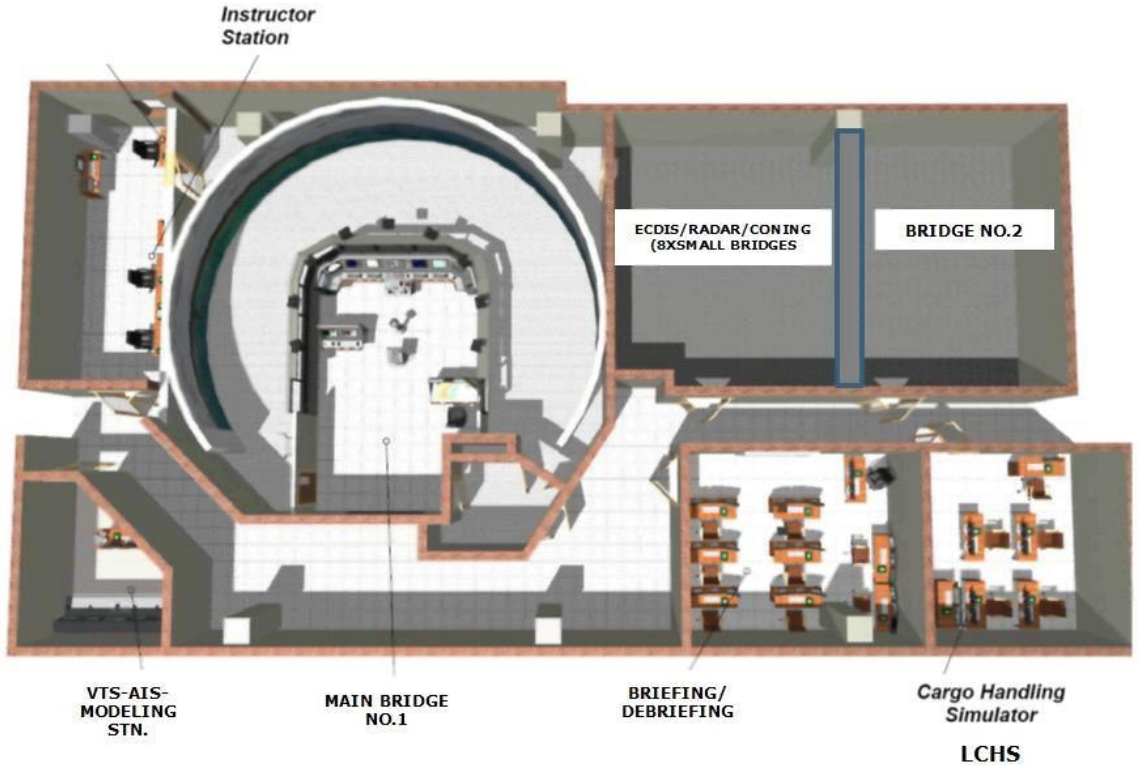

Figure 1. Layout of the simulators on the 6th floor of the Faculty building

Figure 2. ***GMDSS***

Figure 3. ***Planetarium***

Figure 4. SAILOR GMDSS simulator

Figure 5. Navigating bridge simulator

Figure 6. ***Bridge 2 simulator B (NAV), the main bridge and the local instructor's station***

Figure 7. Room fitted with the cargo handling and stability simulator

➢ The ***Marine Engineering Department*** comprises the following facilities and equipment:

- Full Mission Engine Room Simulator (ERS) of MC90-V standard (*Kongsberg maritime AS*)
- Full Mission ERS Simulator *Transas TechSim ver 8.6*
- Engine room simulator *TechSim ver 8.6 – ERS ClassRomm* with 10 work stations
- Hydraulic desk with equipment (Festo Didactic GmbH)
- Pneumatic desk with equipment (Festo Didactic GmbH)
- Welding equipment for training – Electro, MIG-MAG, Gas
- $NO/NO_2/NO_x$ Analyzer – T200
- New generation of mobile cylinder pressure measurement device
- Air Velocity & IAQ measuring instrument including differential pressure
- Refrigeration circuit with variable load
- Steam generator & turbine module

➢ ***Maritime MAN B&W-5L90MC-VLCC Version MC90-V* simulator**

This marine engine simulator enables the students and seafaring officers to acquire theoretical education, practical training, and an experience very close to real life. It consists of the instructor's station, student station, engine control room (ECR) fitted with the most advanced automation systems, and an engine room (ER) with all sub-systems that are included in ship propulsion. The simulator represents a state-of-the-art didactic technology. It comprises a model of the marine two-stroke slow-speed diesel engine (MAN B&W L90 MC-C) of 18,000 kW for the propulsion of large crude oil carriers, with a possibility to choose a fixed pitch or controllable pitch propeller. Besides the main engine, there are two diesel generators, propeller shaft generator, turbo-generator and emergency generator. The simulator provides a real-life simulation of the propulsion machinery and all other engine room plant systems (fuel, oil, air, water, steam etc.). It allows countless scenarios of failures of the main and auxiliary machinery and other ship systems, with all necessary symptoms. The simulator is located in three rooms.

Figure 8. ***Simulator of the control desk in the engine control room***

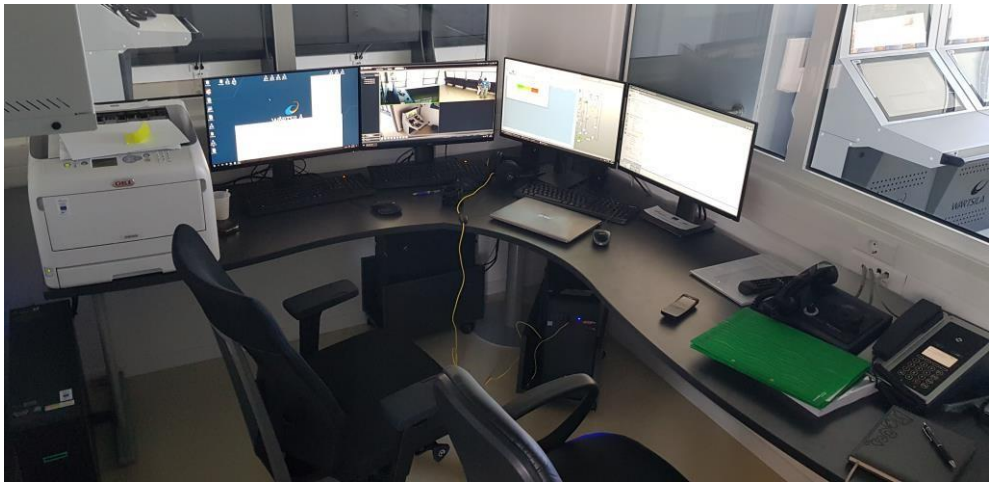

Figure 9. ***Instructor's station of the new TRANSAS full mission simulator***

Ruđera Boškovića 37,
21000 Split, Croatia
Web: www.pfst.unist.hr

Dekanat: +385(0)21 619 402
Tel.: +385(0)21 619 399
Fax: +385(0)21 619 499

IBAN: HR2324070001100059179
OIB: 24624257529

Figures 10. ***Simulation of the engine room (full mission TRANSAS)***

Figure 11. ***Instructor's and student's station of the KONGSBERG simulator***

Figure 12. Engine room of the KONGSBERG simulator

Figure 13. ***ER control room of the ECR KONSBERG simulator***

Figure 14. ***Control desk of the engine room***

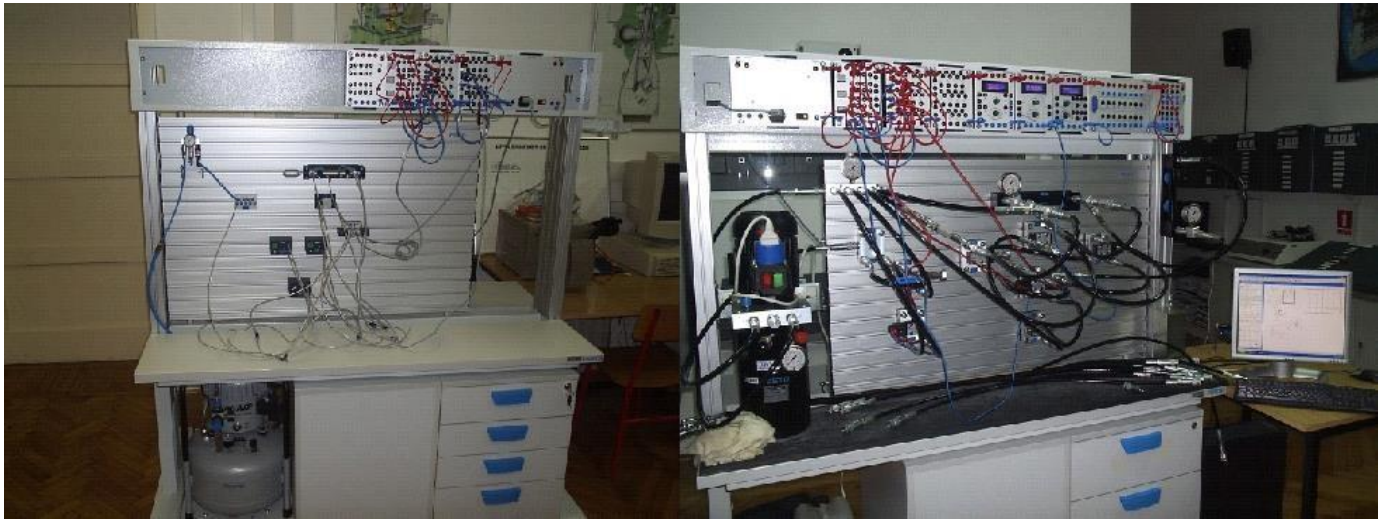

Figure 15. Didactic desk for pneumatics and electro pneumatics & Didactic desk for hydraulics and electrohydraulic ➢

Kongsberg maritime simulator of the diesel-electric propulsion

The simulator of diesel-electric propulsion has been based on a model of a large passenger vessels featuring: 4 x diesel generators of 11.1 MW each; 2 x diesel generators of 600 kW each; 2 x synchronous electric motors of 14 MW each; 2 x directly coupled fixed pitch propellers; 2 bow and 2 stern thrusters. The ship has two separate main power plants, one for 6.6 kV three-phase field and 60 Hz, the other for 440 V three-phase field and 60 Hz. The power plant for 6.6 kV three-phase field is located in a dedicated room within the ship's engine room, whereas the power plant for 440 V is in the engine control room (ECR). The voltage is supplied via the 6.6 kVA electrical plant through 6.6 kV/440 V transformers. The 440 V emergency power plant is supplied via the 440 V electrical plant from the ECR, and can be supplied directly through the emergency diesel generators that are dislocated from the ER to one of the higher decks. The ship drive consists of two three-phase AC electric motors having two separate coils that are individually supplied from their transformers and alternators for the so-called half-engine mode operation. Each electric motor drives a controllable pitch propeller. Side thrusters are driven by four 6.6 kV three-phase AC induction electric motors: two stern thrusters with 1400 kW each and two bow thrusters with 1700 kW each. The air compressors are driven by five large 6.6 kV three-phase electric motors, three of 3000 kW each and two of 2000 kW each.

➢ Full mission *Transas ERS 5000* engine room simulator

The engine room simulator *Transas ERS 5000* is connected to the nautical simulator *Main Bridge 1 Transas NTPro 5000* and is located in three separate rooms. The first room houses the main instructor's station (and the *Kongsberg* maritime engine room simulator ERS L11 5L90MC – VLCC) (Figure 16).

Figure 16. ***Main instructor's station***

The second room comprises 10 student stations, each for 2 students, and one instructor's station (Figure 17), while in the third room there is an engine control room connected to the nautical simulator *Main Bridge 1 Transas NTPro 5000* (Figure 18).

Figure 17. ***Classroom with an instructor's station and ten student stations***

Figure 18. ***ECR integrated with the nautical simulator*** **Main Bridge 1 Transas NTPro 5000**

The marine engine simulator contains the following models of ship propulsion:

- Chemical tanker, NTPro Model TR-S-NT-DB-OM404
- Large crude oil carrier, NTPro Model TR-S-NT-DB-OM435
- Ro-Pax passenger ferry, NTPro Model TR-S-NT-DB-OM427
- Naval patrol frigate ANZAC, NTPro Model TR-S-NT-DB-OM281
- Diesel-electric cruise ship with ABB Azipod, NTPro Model TR-S-NT-DB-OM349 - Steam turbine LNG carrier, NTPro Model TR-S-NT-DB-OM470.

The crew training program, i.e. simulation of the onboard command chain, includes:

- Supervision and operating the ship's engines from the navigating bridge
- Automatic and remote control and supervision from the ECR - Control and supervision from the engine room.

It is possible to simulate the following systems:

- Diesel propulsion
- Steam turbine propulsion
- Auxiliary machinery
- Main, auxiliary and general ship systems.

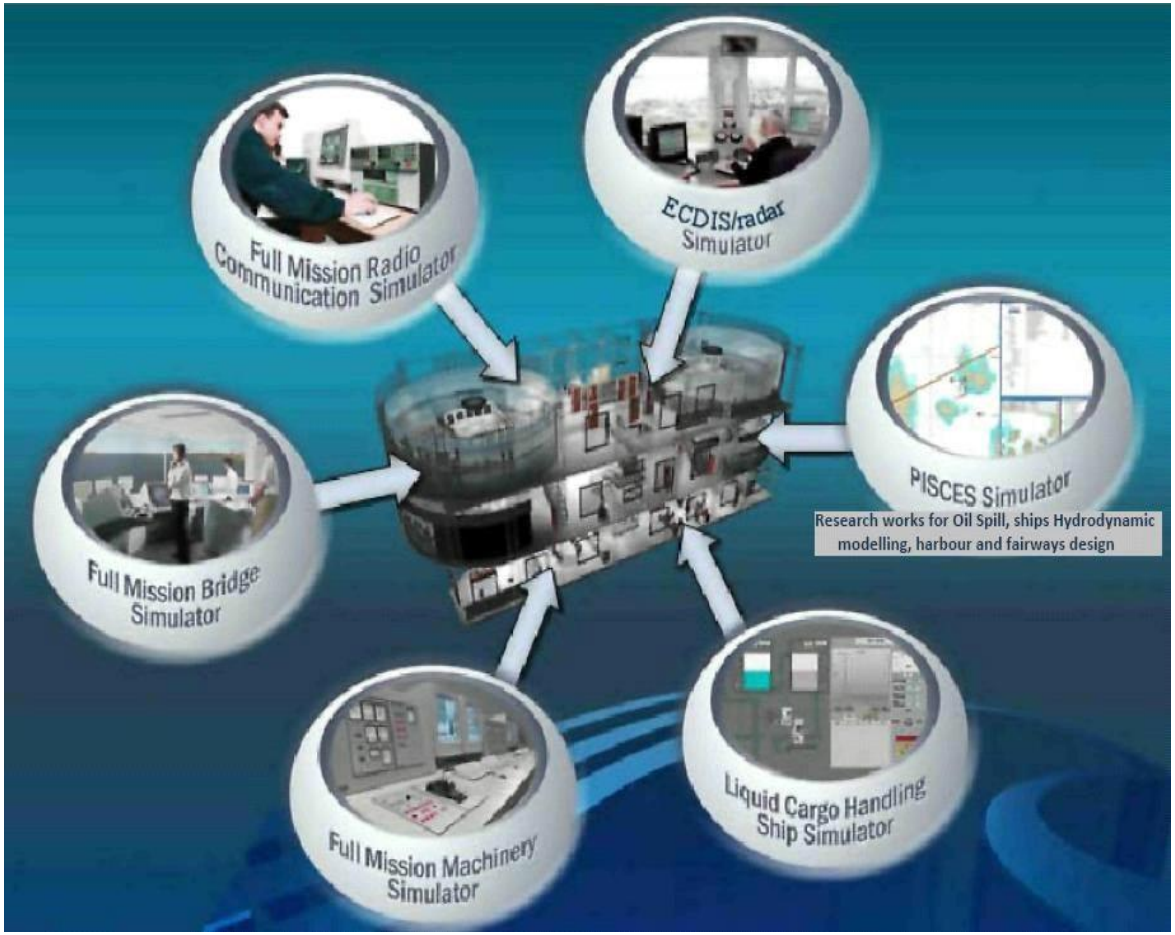

Figure 19. ***Integrated simulator concept***


gunt
HAMBURG
Equipment
for Engineering
Education
ET 850 Steam Generator Module
ET 851 Steam Turbine Module
EXPERIMENT INSTRUCTIONS

Figures 20. Steam generator & turbine module

In old days, the marine engine simulator was used for the education of the students attending the courses in Marine Electrical Engineering and Information Technologies, while exercises were performed in the electrical laboratory on the premises of the Faculty's former old building. They also participated in practical sailing classes. After moving to the new premises on the Campus, this study program uses seven laboratories:

- Automation laboratory
- Laboratory for ship process measurement and management
- Laboratory for signal analysis and processing
- Laboratory for electrical engines and power electronics
- Laboratory for electronics
- Electrical engineering laboratory and High-voltage laboratory.

The High-voltage laboratory features the simulator and all necessary equipment for safe high-voltage operation. The equipment enables the high-voltage training at working level (D49A) and at management level (D49B).

Figure 21. ***High-voltage laboratory***

The Laboratory for electrical engines and power electronics features the one-phase and three-phase transformers, the one-phase and three-phase induction cage motor, and a synchronous DC machine. The laboratory makes full use of the equipment supplied through the project *Functional integration of the University of Split, PMF / PFST / KTF through the development of scientific and research infrastructure in the three faculty (3F) building*. The project partners include the Faculty of Natural Sciences and Mathematics (PMF), Faculty of Maritime Studies (PFST) and Faculty of Chemistry and Technology (KTF). The purpose of the scientific and research tools is to test the parameters of the electrical machines (engines / generators), to make diagnosis of various operation states with regard to specific operating conditions, and to optimise their performance.

Testing performed on machines and individual sets under particular operating states and conditions will result in designing the models for electrical machines which will be offered to the marine and land-based industries for the improvement of features of the existing machines or sub-systems whose functions include the control and optimisation. This will, for example, contribute to the power efficiency in the production of electricity on board various vessels.

The Laboratory for signal analysis and processing - this is the head laboratory of the science-research team for the application of new technologies in maritime industries and the project *Establishment of reference database for studying the influence of weather conditions on marine video surveillance*. The research team has been engaged in examining additive technology in marine applications, infrared thermography, virtual reality technologies, technologies supporting the disabled persons, encryption of autonomous vessels, fusion of sensors with signal processing (especially from the visible and infrared spectrum), detection of environment threats by analysing the available sensors, diagnosis of failures of various signals (including vibration), and artificial intelligence and its impacts on the future of maritime affairs. The laboratory is fitted with optical microscope, robot vehicle, vehicle with inverted pendulum, NI ELVIS data acquisition and processing system, infrared camera, and 3D printer with software tools such as *Labview*, *Matlab*, *Octave*, *123D Design*, *Molecular workbench*, *Se.La.Vi*, *Autodesk Simulation CFD Viewer*, *Ninithi* – software for nanotechnology, LAMMPS for molecular simulations, QT program for multi-platform programming, which can be used for exercise or creating final theses, master theses or research papers.

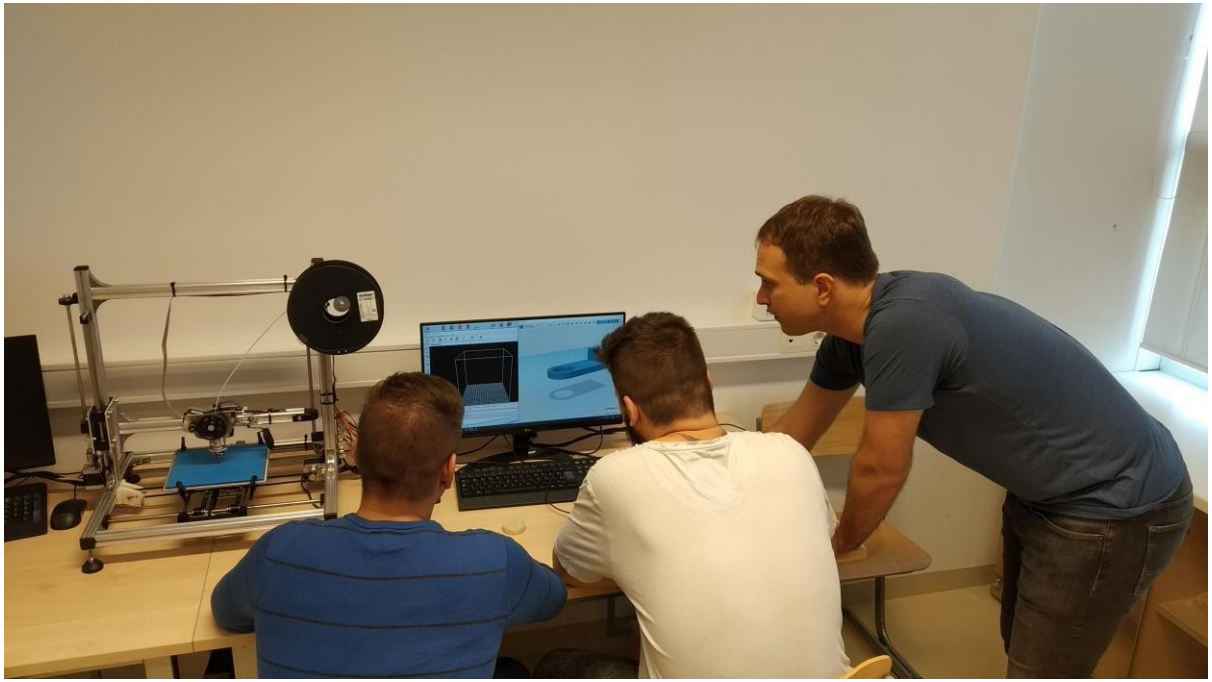

Figure 22. Laboratory for signal analysis and processing

Figure 23. ***GUNT RT 124, vehicle with inverted pendulum, hardware simulator and software for fuzzy control***

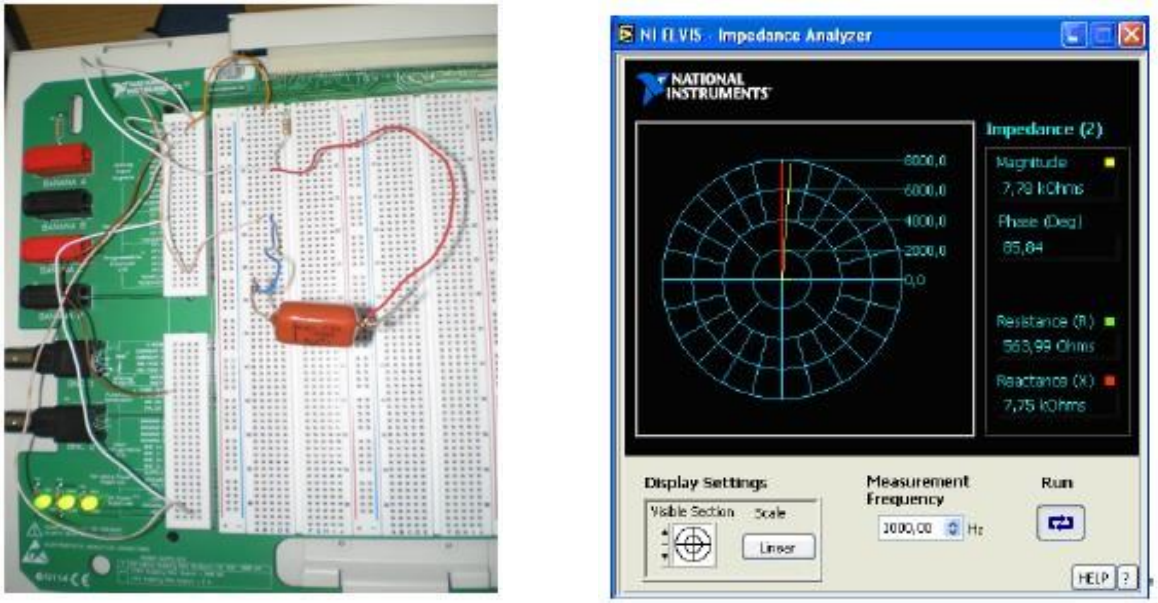

Figure 24. ***NI ELVIS data acquisition and processing system with dedicated software***

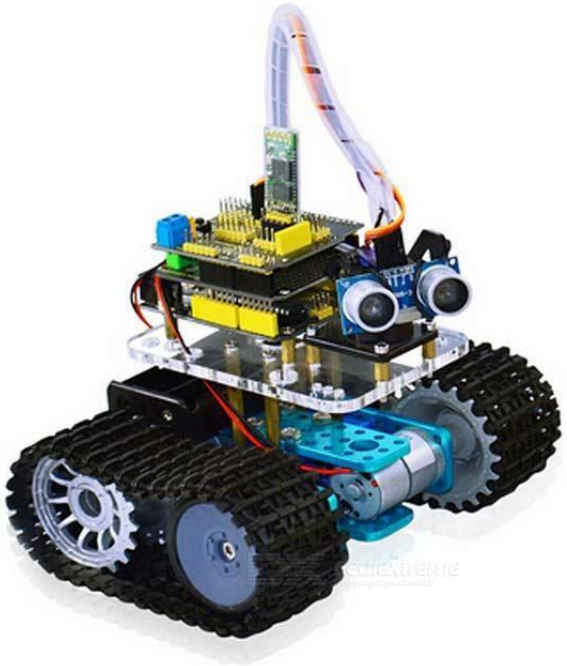

Figure 25. ***Robot mini vehicle (Keyestudio, Arduino, ultrasound sensor, bluetooth module)***

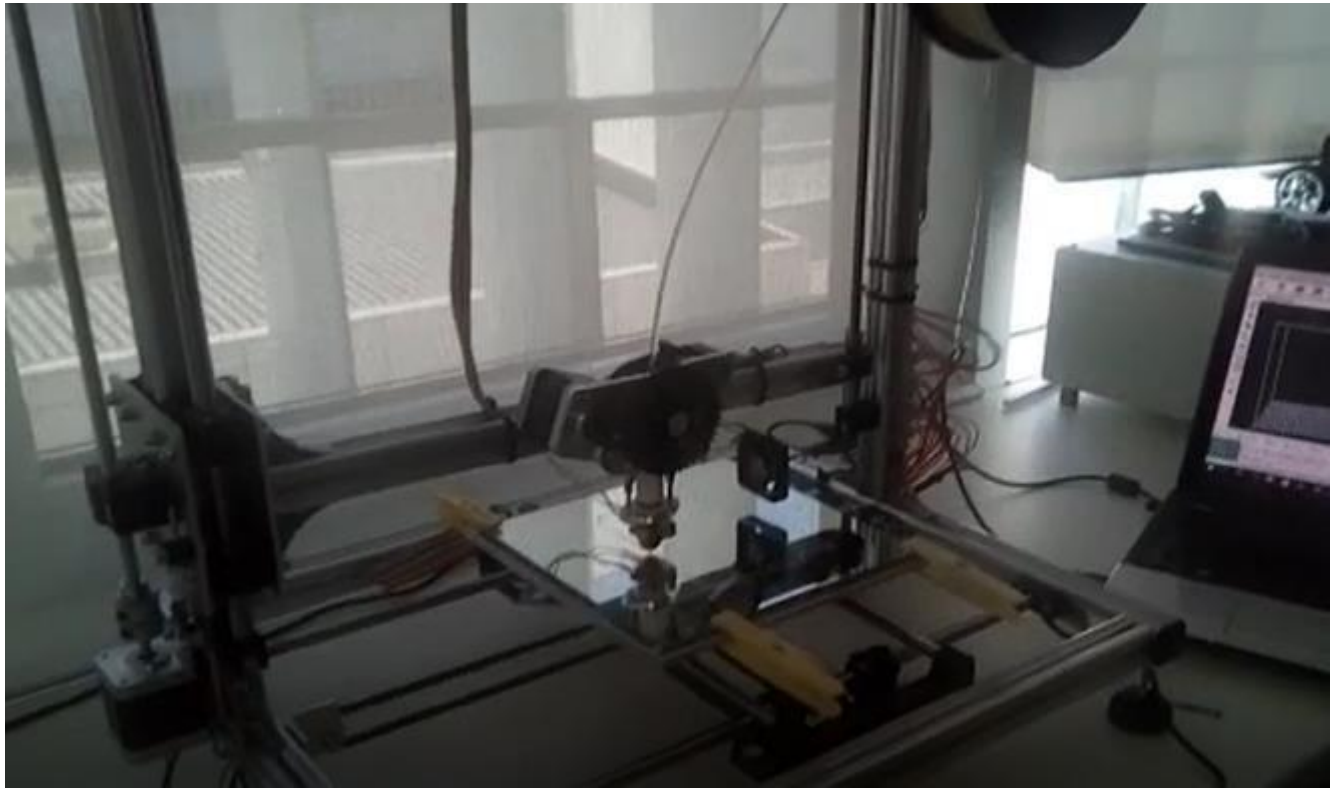

Figure 26. ***3D printer Velleman K8200***

The Laboratory for ship process measurement and management enables student activities in the area of ship systems and processes, using the equipment consisting of the programmable logic regulator (PLC) Siemens, model S7-1214, SINAMICS unit for regulating and starting induction and servo motors and HMI panel, which serve as the interface between a human and a machine for the surveillance of a specific part of the process. The entire equipment is connected to the PROFINET industrial network, where the communication among devices takes place.

Figure 27. ***Laboratory for ship process measurement and management***

The Automation laboratory has been designed for learning the basic principles of the automatic regulation and management. Students are introduced to the essential types of governors, regulators, sensors, actuators and managed objects. The laboratory is fitted with the devices for testing proximity industrial sensors and temperature sensors, for testing and calibration pressure sensors, examination of the cascade regulation, and for setting industrial regulators and models for the simulation of failures in real-life processes. The equipment is used for exploring various algorithms of management. In addition, students learn how to design and make relay management setups (Figure 27).

Ruđera Boškovića 37,
21000 Split, Croatia
Web: www.pfst.unist.hr

Dekanat: +385(0)21 619 402
Tel.: +385(0)21 619 399
Fax: +385(0)21 619 499

IBAN: HR2324070001100059179
OIB: 24624257529

Figure 28. ***Making the relay management sets in the Automation laboratory***

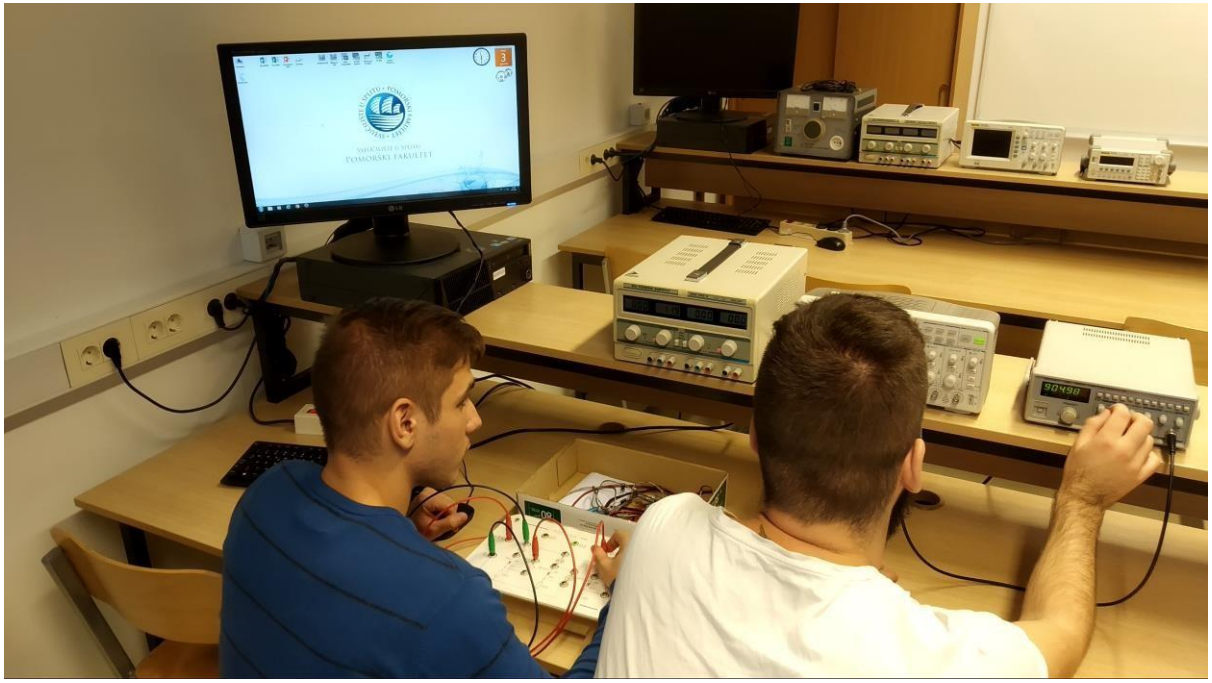

Figure 29. ***Laboratory for electronics***

The quality of classes is considerably enhanced by the already described engine room simulator *Kongsberg*, featuring two modules:

- Diesel mechanical propulsion, and -

Diesel-electric propulsion.

The students of Marine Electrical Engineering and Information Technologies carry out navigation practice on board the vessel *Naše more*, where they typically spend four days being introduced to the duties of the electrical engineering officers on board. They are also introduced to the vessel's engine room, particularly the electrical machinery, i.e. generators and the switchboard. Furthermore, they examine the ship's documents and check the electricity distribution network, lighting, fire-fighting system, navigation equipment and steering gear. They participate in connecting the vessel to the land-based sources of supply, and switching from the ship's own to the shore-based supply system, and vice-versa. During their navigation practice, the students may be allocated other tasks by the crew members and thus become more familiar with the life and work on board.

The Electrical engineering laboratory and the Laboratory for electronics have all necessary equipment for introducing the students into the basic electrical engineering and electronic relations in electric circuits, which represents the groundwork for the progress in other courses. In addition to the students of Marine Electrical Engineering and Information Technologies, practical exercises are performed for the students of Marine Engineering, Maritime Management, Marine Yacht and Marina Technologies, Nautical Engineering Study and Naval Seafaring Study. Furthermore, the laboratory is also used by the students of Marine Biology and Technology at the University Department of Marine Studies.

Figure 30. ***Electrical engineering laboratory***