INSTRUCTIONS
for enrolment in the Doctoral (PhD) Programme "Maritime Studies"
in the academic year 2025/2026

Twenty (20) approved enrolment places are advertised.

Citizens of the Republic of Croatia and persons who do not hold citizenship of the Republic of Croatia may apply, provided that they:

1. have completed a university graduate study or university integrated undergraduate and graduate studies or university specialist studies in the scientific area of Technical Sciences (with 300 ECTS credits including undergraduate studies) or, exceptionally, have completed graduate or integrated or university specialist studies in other fields of science with the condition of passing specific courses;
2. have obtained the academic degree of Master of Science, which they obtained on the basis of a study programme started before the higher education reform of 2005;
3. have completed university undergraduate studies in the scientific field of Traffic and Transport Technology on the basis of study programmes started before the higher education reform of 2005, or undergraduate studies in other scientific fields with the condition of passing specific courses.

Applicants who have obtained a diploma from a foreign educational institution must submit a decision from the competent body on the recognition of the foreign diploma before enrolling in doctoral studies.

Applicants who have completed the degree programmes mentioned in points 1, 2 and 3 with an average grade of at least 3.5 may enrol in doctoral programme. Exceptionally, applicants who have completed their studies with an average grade of less than 3.5 may be enrolled in the programme, if they can present a positive evaluation of their previous scientific research and/or professional activity by the Committee for Science and Doctoral Studies of the University of Rijeka Faculty of Maritime Studies.

Applicants who have completed postgraduate scientific or postgraduate specialist studies, as well as applicants who have already had contact with scientific research activity in their previous work (participation in and presentation at scientific conferences, publication of papers in conference proceedings and/or scientific journals, work on scientific research projects, etc.) will be given preference in the admission process.

The doctoral study programme lasts 3 (three) years.

The total price for the programme is EUR 10,617.82. If the costs of tuition are covered by the company or institution where the applicant is employed, the relevant decision of the employer to cover the costs must be enclosed at the time of enrolment.

The tuition fees for the first and second year of study amount to 3,318.07 euros per year, while 3,981.68 euros are payable for the third year of study. The annual tuition fee can

be paid in two equal instalments, before the start of the even or odd semester. The registration fee for the first year of study is 55,50 euros, and the registration fee for the following years of study is 40 euros per year.

The study programme and the Regulations on the Doctoral (PhD) Programme "Maritime Studies" can be found at the webpage of the Doctoral (PhD) Programme "Maritime Studies".

The applicants shall apply on the prescribed Application form also available at the Faculty Doctoral Study Administration Office (Room 305).

The application for the call is attached:

- a certified copy of the diploma of the previous study,
- a certificate of passed exams with a transcript of the grades of all subjects at the previous study,
- a form explaining the research proposal with the written consent of the potential supervisor,
- a letter of recommendation from a university teacher employed in a research-teaching position,
- list of published scientific and professional works,
- the decision of the applicant's higher education institution or institution on the payment of study costs,
- a copy of the contract for employment at the assistant post, concluded with the university,
- the decision of the company or institution on referring the applicant to doctoral studies and paying the study costs,
- CV.

The list of potential supervisors and related research areas can be found below.

The student is obliged to provide the originals of the documents for inspection at the time of enrolment.

All required prescribed forms can be found at the webpage of the Doctoral (PhD) Programme "Maritime Studies".

Annex 1: List of potential supervisors and research areas

Name	Research areas
Saša Aksentijević, PhD sasa.aksentijevic@pfri.uniri.hr	▪ Information security, business continuity, and business resilience in logistics companies ▪ Development of single-window interfaces in maritime transport ▪ Application of disruptive and innovative technologies in maritime industry and logistics ▪ Digitalization in maritime industry and logistics ▪ Use of sustainable fuels in maritime industry and logistics
Robert Baždarić, PhD robert.bazdaric@pfri.uniri.hr	▪ Control of nonlinear dynamical systems, modeling and simulations, applied to various physical processes: vessel control, propulsion, power generation and distribution, auxiliary services, accommodation facilities, etc. ▪ Application of artificial intelligence in control, hybrid modeling principles including reinforcement, supervised and unsupervised learning for inductive knowledge in marine industry, robotics, mechatronics and electrical engineering
Dean Bernečić, PhD dean.bernecic@pfri.uniri.hr	▪ Thermal processes in internal combustion engines ▪ Connecting virtual and augmented reality to ships plants ▪ Welding and material testing
David Brčić, PhD david.brcic@pfri.uniri.hr	▪ Dispersion of positioning accuracy in satellite-based position determination ▪ Natural and intentional effects on the performance of satellite navigation systems ▪ Modelling ionospheric dynamics, Total Electron Content, and GNSS signal delay: spatial and temporal variability ▪ Alternative PNT methods and technologies in maritime navigation ▪ Risk assessment and mitigation measures in satellite navigation systems ▪ Development and safety solutions in the use of navigational information systems
Borna Debelić, PhD borna.debelic@pfri.uniri.hr	▪ Possibilities for Improvements and Integration of the Governance System of the Maritime Common Good as a Complex Resource ▪ Open Access to Maritime Common Good as a Competitive Advantage in the Development of the Coastal Economy ▪ Decision-making Mechanisms as the Basis of Integrated Coastal Zone Management
Vlado Frančić, PhD vlado.francic@pfri.uniri.hr	▪ Systematic maritime traffic management and monitoring ▪ Modelling of maritime traffic flow ▪ Models of improving safety of navigation by applying new technologies ▪ Models of maritime education and training

Name	Research areas
Neven Grubišić, PhD neven.grubisic@pfri.uniri.hr	▪ Modeling micro-mobility based on activity (ABM) ▪ Simulations of multimodal freight transport ▪ Driving behavior of connected and automatically guided vehicles in a simulated environment ▪ Fleet management and optimization of public transport ▪ Optimization of quay-side transshipment systems at container terminals
Mladen Jardas, PhD mladen.jardas@pfri.uniri.hr	▪ Optimization of delivery flows in port cities: Models for reducing traffic congestion and ecological footprint ▪ Smart logistics systems: IoT and artificial intelligence in optimizing urban delivery networks ▪ Application of green logistics strategies in the development of port urban areas
Irena Jurdana, PhD irena.jurdana@pfri.uniri.hr	▪ Integration of optical communication networks in ship systems ▪ Optical sensor systems for monitoring electrical and non-electrical parameters ▪ Submarine optical networks: design, safety measures, environmental impact, and legal considerations ▪ Use of laser-based systems for detection and ranging in road and maritime transport ▪ Optical fiber-based electronic navigation devices ▪ Advanced electronic navigation systems with optical signal processing ▪ Underwater Wireless Optical Communication (UWOC) technologies ▪ Sustainable, real-time communication solutions for maritime environments
Serdjo Kos, PhD serdjo.kos@pfri.uniri.hr	▪ Risk assessment and their reduction in satellite navigation systems application ▪ Modelling of GNSS positioning deviations ▪ Environmental impacts on the operation and performance of satellite navigation systems with emphasis on natural phenomena ▪ Modelling of ionosphere dynamics and the Total Electron Content ▪ Mitigation of the effects of satellite navigation signals' intentional interference ▪ Alternative PNT methods and technologies ▪ Space weather and its impact on GNSS systems ▪ GNSS positioning error budget and statistical methods in satellite navigation ▪ Productivity and energy efficiency of the full container ships ▪ Mathematical modeling of the optimal transport structure of the full container ships ▪ Modeling of the transport process of marine container

Name	Research areas
	technology ▪ Optimization of intermodal/multimodal transport ▪ Multimodal transport networks
Predrag Kralj, PhD predrag.kralj@pfri.uniri.hr	▪ Optimization of ship propulsion and auxiliary systems with the aim of reducing fuel consumption and pollutant emissions ▪ Ship auxiliary systems analysis and possibilities to improve exploitation methods ▪ Vapor-compression refrigeration systems operation and maintenance harmful impact on the environment analysis ▪ Ship power plant exergy analysis and possibilities of improvement with absorption refrigeration system implementation
Nikola Lopac, PhD nikola.lopac@pfri.uniri.hr	▪ Computer vision for real-time detection and tracking of maritime vessels ▪ Computer vision for identification and classification of underwater objects ▪ Computer vision for monitoring and optimization of operations in nautical tourism ports ▪ Sea state estimation based on ship response to waves using deep learning ▪ Detection and classification of maritime incidents from video surveillance using deep learning ▪ Machine learning for prediction and decision support in maritime operations ▪ Large Language Models (LLMs) for automation of communication and information management in maritime systems ▪ Digital signal processing from ship and maritime sensor systems ▪ Integration of underwater wireless communication and navigation systems ▪ Digital processing and analysis of underwater images ▪ Generative artificial intelligence models for maritime data synthesis and algorithm training ▪ Artificial intelligence and satellite/aerial image processing for marine environment monitoring
Livia Maglić, PhD livia.maglic@pfri.uniri.hr	▪ Adaptive port planning ▪ Storage and stacking logistics problems at container terminals ▪ Sustainable marinas ▪ The impact of nautical tourism on marine environment pollution ▪ Assessment of crane operator's workload ▪ Digital selection procedures for work at port container terminals

Name	Research areas
Đani Mohović, PhD dani.mohovic@pfri.uniri.hr	▪ Model for determining the minimum avoidance distance between vessels in collision courses ▪ Development of avoidance model for autonomous unmanned ships ▪ Risk assessment of the navigation of unmanned autonomous ships ▪ Development of navigation safety monitoring models for yachts and boats
Robert Mohović, PhD robert.mohovic@pfri.uniri.hr	▪ Research of the maritime aspect of the planning and design of ports and waterways in confined areas ▪ Maritime safety of vessels during manoeuvring ▪ Maritime safety of vessels at berth
Dario Ogrizović, PhD dario@pfri.uniri.hr	▪ Models and applications of generative artificial intelligence in maritime industry ▪ Techniques for developing applications with LLM (PEFT, LoRA and RAG) ▪ Explainable AI (XAI) applications ▪ Big data analysis methodology and big data analysis systems ▪ HPC, HTC, cluster, grid and cloud computing for data analysis and simulation ▪ Discrete event simulation, simulation modeling, modeling methods, design and conducting of simulation experiments, analysis and verification ▪ Elements of interactive simulation systems. Design, modelling and implementation of virtual reality (VR), augmented reality (AR), mixed reality (MR) and extended reality (XR). Sensation, perception, movement, interaction and immersion. ▪ Risk, threat, vulnerability assessment and critical infrastructure protection
Vladimir Pelić, PhD vladimir.pelic@pfri.uniri.hr	▪ Optimization of marine diesel engine ▪ Numerical modelling of the ship's energy system ▪ Alternative energy sources and marine propulsion systems
Tanja Poletan Jugović, PhD tanja.poletan@pfri.uniri.hr	▪ Models of formation and consolidation of passenger and freight flows in the function of sustainable transport development ▪ Valorisation of transport routes and corridors on the global and regional transport services market ▪ Planning and logistics in the function of passenger and freight flows optimization ▪ Logistics models in the context of documentation and transport process optimization ▪ Current challenges of transport routes planning and valorisation in the context of the "green transition"
Radoslav Radonja, PhD	▪ Exhaust emissions from marine energy systems and their

Name	Research areas
radoslav.radonja@pfri.uniri.hr	environmental impact ▪ Possibilities of using alternative fuels in maritime transportation ▪ Acidification and eutrophication of the sea
Biserka Rukavina, PhD biserka.rukavina@pfri.uniri.hr	▪ Legal framework for concession on the maritime domain ▪ Liability systems for damage to the maritime environment ▪ Legal aspects of marine spatial planning ▪ Prevention of marine pollution from ships
Davor Šakan, PhD davor.sakan@pfri.uniri.hr	▪ Implementation of new maritime voyage planning and decision support technologies ▪ Application of global path planning in maritime voyage planning ▪ Characteristics of IMO, IHO and ISO standards with the possibilities of implementation of electronic navigational charts in information and navigation systems ▪ Spatiotemporal analysis and interpretation of ship movement patterns
Edvard Tijan, PhD edvard.tijan@pfri.uniri.hr	▪ Transport digitalization/Maritime transport digitalization/Seaport digitalization ▪ Digital transformation of transport/Digital transformation of maritime transport/Digital transformation of seaports ▪ Information systems in transport/Information systems in maritime transport/Information systems in seaports ▪ Information management in transport/Information management in maritime transport/Information management in seaports ▪ Maritime Single Windows ▪ Port Community Systems ▪ Smart Ports ▪ Hydrogen as a marine fuel
Sanjin Valčić, PhD sanjin.valcic@pfri.uniri.hr	▪ Modernization of the Global Maritime Distress and Safety System ▪ Atmospheric impact analysis on digital maritime communication systems ▪ Application of 5G networks in maritime communications ▪ Potential applications of VHF Data Exchange System in maritime domain
Siniša Vilke, PhD sinisa.vilke@pfri.uniri.hr	▪ Sustainability of intermodal transport systems ▪ Optimization of intermodal/inland transport corridors ▪ Technological and organizational aspects of urban transport and environment ▪ Optimization and sustainability of transport in logistics systems
Goran Vizentin, PhD goran.vizentin@pfri.uniri.hr	▪ Impact of the marine environment on additively manufactured materials ▪ Recycling of additively manufactured materials in marine

Name	Research areas
	environment ▪ Spread of fire on a ship and evacuation of passengers in virtual reality
Dražen Žgaljić, PhD drazen.zgaljic@pfri.uniri.hr	▪ Short Sea Shipping and Motorways of the Sea ▪ Development of multimodal and intermodal transport system ▪ Development of port systems ▪ Identification of success criteria in port systems ▪ Development of a model for evaluating the performance potential of a maritime transport route or service ▪ Identification of elements and definition of a development concept for sustainable ports of county and local level ▪ Critical infrastructure in the transport system
Frano Barbir, PhD fbarbir@fesb.hr	▪ Hydrogen technologies for marine applications ▪ Safety aspects of hydrogen ▪ e-fuels produced from hydrogen
Nermin Hasanspahić, PhD nermin.hasanspahic@unidu.hr	▪ Modeling the impact of human factors on maritime safety ▪ Modeling near-miss management system in shipping ▪ Evaluation of human error probability in maritime transportation
Josip Orović, PhD jorovic@unizd.hr	▪ Optimization of ship propulsion systems ▪ Analysis of faults and failures in ship propulsion systems
Marko Perković, PhD marko.perkovic@fpp.uni-lj.si	▪ Develop innovative, resilient methods for the design of ports and waterways, taking into account global climate impacts and the challenges for shipping resulting from the increasing size of ships, using numerical models and simulations of ship handling in full operation to assess the adaptability and safety of infrastructure ▪ Improving maritime security by addressing vulnerabilities caused by GNSS jamming and spoofing through advanced simulation-based risk assessment, integration of alternative positioning technologies and machine learning approaches for anomaly detection and resilient navigation techniques
Tomislav Senčić, PhD tomislav.sencic@riteh.uniri.hr	▪ Internal combustion engines proceses numerical simulations
Marko Valčić, PhD mvalcic@unizd.hr	▪ Advanced artificial intelligence methods in maritime systems management ▪ Advanced optimisation methods in maritime process management ▪ Optimal guidance and control of ships and other marine vessels ▪ Autonomous navigation and autonomous vessels (MASS) ▪ Robust and stochastic optimisation of shipping company operations