

**INSTRUCTIONS**  
**for enrolment in the Doctoral (PhD) Programme "Maritime Studies"**  
**in the academic year 2026/2027**

Fifteen (15) 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
<p>Saša Aksentijević, PhD sasa.aksentijevic@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Cybersecurity, business continuity, and business resilience in logistics companies</li> <li>▪ Development of single-window interfaces in maritime transport</li> <li>▪ Application of disruptive and innovative technologies in maritime industry and logistics</li> <li>▪ Use of sustainable fuels in maritime industry and logistics</li> </ul>
<p>Robert Baždarić, PhD robert.bazdaric@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ 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.</li> <li>▪ 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</li> </ul>
<p>David Brčić, PhD david.brcic@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Dispersion of positioning accuracy in satellite-based position determination</li> <li>▪ Natural and intentional effects on the performance of satellite navigation systems</li> <li>▪ Modelling ionospheric dynamics, Total Electron Content, and GNSS signal delay: spatial and temporal variability</li> <li>▪ Alternative PNT methods and technologies in maritime navigation</li> <li>▪ Risk assessment and mitigation measures in satellite navigation systems</li> <li>▪ Development and safety solutions in the use of navigational information systems</li> <li>▪ Electronic navigation environment</li> </ul>
<p>Aleksandar Cuculić, PhD aleksandar.cuculic@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Ship electrical power systems</li> <li>▪ Application of battery and hybrid drives on ships</li> <li>▪ Technology of shore connections and charging stations in ports</li> <li>▪ Protection of the sea and the marine environment</li> </ul>
<p>Jasmin Ćelić, PhD jasmin.celic@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Cooperative Intelligent Transport Systems (C-ITS), smart mobility, and advanced information and communication technologies in transport and maritime domains</li> <li>▪ Maritime cybersecurity, resilience, and the security of shipboard information systems</li> <li>▪ Applications of artificial intelligence in maritime, transport, and engineering systems</li> <li>▪ Internet of Things (IoT), cyber-physical systems, and intelligent infrastructure monitoring</li> <li>▪ Digital twins, remote maintenance, and predictive</li> </ul>

Name	Research areas
	<p>analytics in maritime and industrial systems</p> <ul style="list-style-type: none"> <li>▪ Automation, control, and intelligent decision-support systems</li> <li>▪ Sustainable energy technologies and decarbonisation of the maritime sector</li> <li>▪ Renewable energy sources, photovoltaic systems, and emerging solar cell technologies</li> <li>▪ Advanced digital technologies in education and professional training</li> <li>▪ Quantum computing: architectures, performance, and future perspectives</li> </ul>
<p>Borna Debelić, PhD borna.debelic@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Possibilities for Improvements and Integration of the Governance System of the Maritime Common Good as a Complex Resource</li> <li>▪ Open Access to Maritime Common Good as a Competitive Advantage in the Development of the Coastal Economy</li> <li>▪ Decision-making Mechanisms as the Basis of Integrated Coastal Zone Management</li> </ul>
<p>Marko Gulić, PhD marko.gulic@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Optimization of logistics processes in the maritime sector</li> </ul>
<p>Mladen Jardas, PhD mladen.jardas@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Optimization of delivery flows in port cities: Models for reducing traffic congestion and ecological footprint</li> <li>▪ Smart logistics systems: IoT and artificial intelligence in optimizing urban delivery networks</li> <li>▪ Application of green logistics strategies in the development of port urban areas</li> </ul>
<p>Alen Jugović, PhD alen.jugovic@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Port Economics and Management in the Context of Globalization. Scientifically grounded analysis of economic models of seaport management, including the optimization of port operations, evaluation of infrastructural capacities, and enhancement of port competitiveness within global logistics networks</li> <li>▪ Logistics Systems and Organization of the Maritime and Transport Sector. Research on complex logistics chains and transport systems, with an emphasis on the integration, optimization, and digitalization of processes aimed at improving efficiency and sustainability</li> <li>▪ Shipping Economics and Dynamics of the Maritime Passenger Market. Analysis of the economic principles of shipping operations, market structures, and development trends in maritime passenger transport, maritime passenger connections, the cruise industry and its impact on regional development</li> <li>▪ Strategic Planning and Development of Port and Transport Systems. Research into methodologies for the</li> </ul>

Name	Research areas
	<p>design and implementation of development strategies for port and transport systems, with a focus on integrated transport planning, spatial dimensions, and long-term sustainability</p> <ul style="list-style-type: none"> <li>▪ Entrepreneurship and Management in Maritime and Transport Sectors. Analysis of managerial and entrepreneurial models in the maritime and transport sectors, with particular emphasis on small and medium-sized enterprises, their competitiveness, financial structures, and adaptation to dynamic market conditions</li> </ul>
<p>Irena Jurdana, PhD irena.jurdana@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Integration of optical communication networks in ship systems</li> <li>▪ Optical sensor systems for monitoring electrical and non-electrical parameters</li> <li>▪ Submarine optical networks: design, safety measures, environmental impact, and legal considerations</li> <li>▪ Use of laser-based systems for detection and ranging in road and maritime transport</li> <li>▪ Optical fiber-based electronic navigation devices</li> <li>▪ Advanced electronic navigation systems with optical signal processing</li> <li>▪ Underwater Wireless Optical Communication (UWOC) technologies</li> <li>▪ Sustainable, real-time communication solutions for maritime environments</li> </ul>
<p>Ines Kolanović, PhD ines.kolanovic@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Development and validation of a model for quality evaluation in maritime activities</li> <li>▪ Comparative analysis of existing quality evaluation models for service quality improvement</li> <li>▪ Quality management systems in maritime organizations in the function of sustainable development</li> <li>▪ Seaport quality systems and their impact on user satisfaction</li> </ul>
<p>Serdjo Kos, PhD serdjo.kos@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Risk assessment and their reduction in satellite navigation systems application</li> <li>▪ Modelling of GNSS positioning deviations</li> <li>▪ Environmental impacts on the operation and performance of satellite navigation systems with emphasis on natural phenomena</li> <li>▪ Modelling of ionosphere dynamics and the Total Electron Content</li> <li>▪ Mitigation of the effects of satellite navigation signals' intentional interference</li> <li>▪ Alternative PNT methods and technologies</li> <li>▪ Space weather and its impact on GNSS systems</li> <li>▪ GNSS positioning error budget and statistical methods in</li> </ul>

Name	Research areas
	satellite navigation <ul style="list-style-type: none"> <li>▪ Productivity and energy efficiency of the full container ships</li> <li>▪ Mathematical modeling of the optimal transport structure of the full container ships</li> <li>▪ Modeling of the transport process of marine container technology</li> <li>▪ Optimization of intermodal/multimodal transport</li> <li>▪ Multimodal transport networks</li> </ul>
Predrag Kralj, PhD predrag.kralj@pfri.uniri.hr	<ul style="list-style-type: none"> <li>▪ Optimization of ship propulsion and auxiliary systems with the aim of reducing fuel consumption and pollutant emissions</li> <li>▪ Ship auxiliary systems analysis and possibilities to improve exploitation methods</li> <li>▪ Vapor-compression refrigeration systems operation and maintenance harmful impact on the environment analysis</li> <li>▪ Ship power plant exergy analysis and possibilities of improvement with absorption refrigeration system implementation</li> </ul>
Nikola Lopac, PhD nikola.lopac@pfri.uniri.hr	<ul style="list-style-type: none"> <li>▪ Artificial Intelligence and Machine Learning in Maritime Systems</li> <li>▪ Computer Vision and Image Analysis in Maritime Systems</li> <li>▪ Digital Signal Processing and Sensor Data Analysis in Maritime Systems</li> <li>▪ Unmanned Aerial Systems and Multi-Sensor Integration for Maritime Applications</li> </ul>
Livia Maglić, PhD livia.maglic@pfri.uniri.hr	<ul style="list-style-type: none"> <li>▪ Adaptive port planning</li> <li>▪ Storage and stacking logistics problems at container terminals</li> <li>▪ Sustainable marinas</li> <li>▪ The impact of nautical tourism on marine environment pollution</li> <li>▪ Assessment of crane operator's workload</li> <li>▪ Digital selection procedures for work at port container terminals</li> </ul>
Đani Mohović, PhD dani.mohovic@pfri.uniri.hr	<ul style="list-style-type: none"> <li>▪ Model for determining the minimum avoidance distance between vessels in collision courses</li> <li>▪ Development of avoidance model for autonomous unmanned ships</li> <li>▪ Risk assessment of the navigation of unmanned autonomous ships</li> <li>▪ Development of navigation safety monitoring models for yachts and boats</li> </ul>
Robert Mohović, PhD robert.mohovic@pfri.uniri.hr	<ul style="list-style-type: none"> <li>▪ Research of the maritime aspect of the planning and design of ports and waterways in confined areas</li> <li>▪ Maritime safety of vessels during manoeuvring</li> </ul>

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<p>Gorana Mudronja, PhD gorana.mudronja@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Maritime safety of vessels at berth</li> <li>▪ Sustainable transformation of ports and maritime transport: economic impacts, modelling and public policy</li> <li>▪ Assessment of the socio-economic impacts of sustainable and digital technologies in ports (e.g. shore power)</li> <li>▪ Modelling the behaviour of stakeholders in maritime and logistics systems</li> <li>▪ Cost-benefit analysis (CBA) and application of welfare economics in transport</li> <li>▪ Sustainable development of port systems and their impact on the regional economy</li> <li>▪ Analysis of externalities and the impact of maritime transport on the environment and quality of life</li> </ul>
<p>Ivan Panić, PhD ivan.panic@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Optimization methods for ship electric propulsion to reduce specific fuel consumption and emissions</li> <li>▪ Modeling and optimization of alternative energy source integration in shipboard power systems</li> <li>▪ Advanced control and optimization of shore power supply systems for hybrid and fully electric ships</li> <li>▪ Safety, energy, and technological aspects of hydrogen application in marine systems</li> <li>▪ Modeling, control, and integration of fuel cells in hybrid and electric ship power systems</li> </ul>
<p>Vladimir Pelić, PhD vladimir.pelic@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Optimization of marine diesel engine</li> <li>▪ Numerical modelling of the ship's energy system</li> <li>▪ Alternative energy sources and marine propulsion systems</li> </ul>
<p>Ana Perić Hadžić, PhD ana.peric@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Optimization of logistics service using autonomous vehicles with a supply chain accessibility model</li> <li>▪ Public-private partnership (PPP) models in the port area</li> <li>▪ Public-private partnership (PPP) models for smart city development</li> <li>▪ Design, modeling, and applications of virtual reality (VR), augmented reality (AR), mixed reality (MR), and extended reality (XR), Interactive simulation systems</li> </ul>
<p>Tanja Poletan Jugović, PhD tanja.poletan@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Models of formation and consolidation of passenger and freight flows in the function of sustainable transport development</li> <li>▪ Valorisation of transport routes and corridors on the global and regional transport services market</li> <li>▪ Planning and logistics in the function of passenger and freight flows optimization</li> <li>▪ Logistics models in the context of documentation and transport process optimization</li> <li>▪ Current challenges of transport routes planning and valorisation in the context of the "green transition"</li> </ul>

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<p>Radoslav Radonja, PhD radoslav.radonja@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Exhaust emissions from marine energy systems and their environmental impact</li> <li>▪ Possibilities of using alternative fuels in maritime transportation</li> <li>▪ Acidification and eutrophication of the sea</li> <li>▪ Optimization of the ship's energy efficiency</li> </ul>
<p>Đani Šabalja, PhD dani.sabalja@uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Introduction and development of new technologies for the removal of marine oil pollution.</li> <li>▪ Advanced methods for optimising procedures for dealing with marine oil pollution.</li> <li>▪ Methods for improving the protection system against plastic marine pollution.</li> </ul>
<p>Davor Šakan, PhD davor.sakan@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Implementation of new maritime voyage planning and decision support technologies</li> <li>▪ Application of global path planning in maritime voyage planning</li> <li>▪ Characteristics of IMO, IHO and ISO standards with the possibilities of implementation of electronic navigational charts in information and navigation systems</li> <li>▪ Spatiotemporal analysis and interpretation of ship movement patterns</li> </ul>
<p>Edvard Tijan, PhD edvard.tijan@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Transport digitalization/Maritime transport digitalization/Seaport digitalization</li> <li>▪ Digital transformation of transport/Digital transformation of maritime transport/Digital transformation of seaports</li> <li>▪ Information systems in transport/Information systems in maritime transport/Information systems in seaports</li> <li>▪ Information management in transport/Information management in maritime transport/Information management in seaports</li> <li>▪ Maritime Single Windows</li> <li>▪ Port Community Systems</li> <li>▪ Smart Ports</li> <li>▪ Hydrogen as a marine fuel</li> <li>▪ Green and sustainable logistics</li> </ul>
<p>Sandra Tominac Coslovich, PhD dr. sc. Sandra Tominac Coslovich</p>	<ul style="list-style-type: none"> <li>▪ Maritime VHF communication</li> <li>▪ The impact of multicultural crews on ship safety</li> <li>▪ Intercultural competences and communication on board</li> </ul>
<p>Fran Torbarina, PhD fran.torbarina@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Waste heat recovery on passenger ships</li> <li>▪ Energy efficiency analysis of heat exchangers using numerical methods such as the control volume method</li> <li>▪ Energy efficiency in building construction</li> </ul>
<p>Sanjin Valčić, PhD sanjin.valcic@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Modernization of the Global Maritime Distress and Safety System</li> <li>▪ Atmospheric impact analysis on digital maritime communication systems</li> </ul>

Name	Research areas
	<ul style="list-style-type: none"> <li>▪ Application of 5G networks in maritime communications</li> <li>▪ Potential applications of VHF Data Exchange System in maritime domain</li> </ul>
<p>Siniša Vilke, PhD sinisa.vilke@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Sustainability of intermodal transport systems</li> <li>▪ Optimization of intermodal/inland transport corridors</li> <li>▪ Technological and organizational aspects of urban transport</li> <li>▪ Optimization and sustainability of transport in logistics systems</li> <li>▪ Technology and sustainability of inland transport systems</li> </ul>
<p>Goran Vizentin, PhD goran.vizentin@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Impact of the marine environment on additively manufactured materials</li> <li>▪ Recycling of additively manufactured materials in the marine environment</li> <li>▪ Spread of fire on a ship and evacuation of passengers in virtual reality</li> <li>▪ Optimization of marine structure elements</li> </ul>
<p>Dražen Žgaljić, PhD drazen.zgaljic@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Short Sea Shipping and Motorways of the Sea</li> <li>▪ Development of multimodal and intermodal transport system</li> <li>▪ Development of port systems</li> <li>▪ Identification of success criteria in port systems</li> <li>▪ Development of a model for evaluating the performance potential of a maritime transport route or service</li> <li>▪ Identification of elements and definition of a development concept for sustainable ports of county and local level</li> <li>▪ Critical infrastructure in the transport system</li> </ul>
<p>Srđan Žuškin, PhD srđan.zuskin@pfri.uniri.hr</p>	<ul style="list-style-type: none"> <li>▪ Concept development possibilities of navigation information systems in the function of increasing safety at sea</li> <li>▪ Concept development possibilities of navigation information systems in the function of environmental protection</li> <li>▪ Decision support system development for autonomous navigation</li> <li>▪ Decision support system development for collision alerting improvement at sea</li> <li>▪ COLREG-compliant Decision Support System development</li> </ul>
<p>Frano Barbir, PhD fbarbir@fesb.hr</p>	<ul style="list-style-type: none"> <li>▪ Hydrogen technologies for marine applications</li> <li>▪ Safety aspects of hydrogen</li> <li>▪ e-fuels produced from hydrogen</li> </ul>
<p>Mate Barić, PhD mbaric@unizd.hr</p>	<ul style="list-style-type: none"> <li>▪ Analysis and modelling safety of navigation in restricted waterways</li> <li>▪ Modelling of safety of navigation regarding collision</li> </ul>

Name	Research areas
	avoidance <ul style="list-style-type: none"> <li>▪ Improving methods for calculation external forces acting on ship</li> </ul>
Nermin Hasanspahić, PhD nermin.hasanspahic@unidu.hr	<ul style="list-style-type: none"> <li>▪ Modeling the impact of human factors on maritime safety</li> <li>▪ Modeling near-miss management system in shipping</li> <li>▪ Evaluation of human error probability in maritime transportation</li> </ul>
Ljudevit Krpan, PhD ljkrpan@unin.hr	<ul style="list-style-type: none"> <li>▪ Land-use Transport Planning</li> <li>▪ Sustainable transport system</li> <li>▪ Intelligent Transport Systems</li> <li>▪ Transport Safety</li> </ul>
Nikola Mandić, PhD nmandic@pfst.hr	<ul style="list-style-type: none"> <li>▪ Legal regulation of recreational vessels and ports in nautical tourism</li> <li>▪ Legal aspects of maritime navigational safety</li> <li>▪ Legal regulation of coastal liner maritime transport</li> </ul>
Marko Perković, PhD marko.perkovic@fpp.uni-lj.si	<ul style="list-style-type: none"> <li>▪ Resilient port and waterway design under climate change and increasing vessel size using simulation</li> <li>▪ Navigation resilience to GNSS jamming and spoofing via alternative positioning and AI-based detection</li> <li>▪ Integration of satellite remote sensing with AIS/VTS for maritime safety and risk monitoring</li> <li>▪ Coupled bridge simulation and hydrodynamic modelling for sediment resuspension assessment</li> <li>▪ Quantitative methods for collision risk analysis and anticollision decision support in maritime traffic</li> </ul>
Tomislav Senčić, PhD tomislav.sencic@riteh.uniri.hr	<ul style="list-style-type: none"> <li>▪ Internal combustion engines processes numerical simulations</li> </ul>
Marko Valčić, PhD mvalcic@unizd.hr	<ul style="list-style-type: none"> <li>▪ Advanced artificial intelligence methods in maritime systems management</li> <li>▪ Advanced optimisation methods in maritime process management</li> <li>▪ Dynamic positioning of marine vessels</li> <li>▪ Optimal guidance and control of ships and other marine vessels</li> <li>▪ Robust and stochastic optimisation of shipping company operations</li> <li>▪ Autonomous navigation and autonomous ships (MASS)</li> <li>▪ Regulation of artificial intelligence and autonomous navigation in maritime transport</li> </ul>