**INSTRUCTIONS**

**for the enrolment in the Postgraduate Doctoral (PhD) Programme "Maritime Studies" in the academic year 2021/2022**

Applications are invited for the enrolment of 25 (twenty-five) students; 10 (ten) of which may enrol as full-time students, and 15 (fifteen) as part-time students.

**Citizens of the Republic of Croatia, foreign citizens as well as persons with no citizenship have, under the same conditions, the right to apply for the enrolment if:**

1. They have completed the graduate university study in technical sciences (i.e. acquired 300 ECTS credits, the undergraduate study included), or exceptionally, they have completed the graduate or integrated study in other scientific areas. In latter case, applications will be required to complete supplemental courses. If the Commission for Science and Postgraduate Doctoral (PhD) Programme "Maritime Studies" ascertains that an applicant requires additional knowledge in traffic and transport technology, it will submit a proposal to the Faculty Council, which shall then pass a decision on the required supplemental courses, which can be awarded a maximum of 60 ECTS. All costs incurred for supplemental subjects shall be borne by the applicant,

2. They have obtained an academic degree of Master of Sciences (M.Sc.) according to the study programs in force before the 2005 higher educational reform. The earned academic degree of Master of Sciences enables the applicant to enrol in the postgraduate study starting with up to 60 ECTS credits. The exact number of ECTS credits granted to applicants as an equivalent to the earned degree of Master of Sciences is prescribed by the Commission for Science and Postgraduate Doctoral (PhD) Programme "Maritime Studies" for each applicant individually. The applicant cannot be exempted from obligations of acquiring ECTS credits pertaining to the PhD thesis,

3. They have completed an undergraduate university study in the field of traffic and transport technology according to the study programs in force before the 2005 higher educational reform or an undergraduate study in other scientific areas in which case applications will be required to complete supplemental courses. If the Commission for Science and Postgraduate Doctoral (PhD) Programme "Maritime Studies" ascertains that an applicant requires additional knowledge in traffic and transport technology, it will submit a proposal to the Faculty Council, which shall then pass a decision on the required supplemental courses, which can be awarded a maximum of 60 ECTS. All costs incurred for supplemental subjects shall be borne by the applicant.

Preference of enrolment is given to applicants who have completed postgraduate scientific or postgraduate specialist studies, as well as to those applicants who have already gained certain experience in scientific research (attendance and presentations at scientific

conferences, publication of papers in conference proceedings and/or scientific journals, engagement on research projects, etc.)

The postgraduate university study lasts six (6) semesters.

The full price cost of the study amounts to HRK 80,000.00. If the tuition fee is paid by the company or institution the applicant is working at, a relevant decision on the tuition fee payment must be presented at enrolment.

The first-year study fee in the academic year 2020/2021 amounts to HRK 25,000.00. This amount can be paid in two equal instalments, at the beginning of the first and the second semester, respectively.

The Study program and the Regulations on the Postgraduate Doctoral (PhD) Programme "Maritime Studies" (for the academic year 2021/2022) are available on the website of the Faculty:

*https://www.pfri.uniri.hr/web/en/postgradute_doctoral_education.php*

Applicants applying for the study shall fill in a prescribed application form available at the web site of the Faculty and the Faculty postgraduate university study office (Room 305).

Applicants shall submit the following documents:

- certified copy of the university degree (Diploma),
- certified list of all previously attended courses with grades and the obtained average grade,
- the rationale of the preferred area of research (prescribed form),
- consent of a potential mentor/co-mentor (prescribed form),
- letter of recommendation from a university teacher with the scientific-teaching vocation,
- list of published research and/or professional papers,
- biography.

A list of potential mentors and related research topics is **attached at the end** of these *Instructions*.

The student is obliged to submit the original documents for consideration at the enrolment. All required prescribed forms can be found at the *Programme* website:

*https://www.pfri.uniri.hr/web/en/forms.php*

The enrolment rank-list is formed by ranking full-time students first, followed by part-time students.

## Attachment 1: List of potential mentors and research topics

| Name | Research topics |
|---|---|
| David Brčić, PhD | ▪ Risk assessment and their reduction in satellite navigation systems application<br>▪ Modelling of GNSS positioning deviations<br>▪ Environmental impacts on the operation and performance of satellite navigation systems with emphasis on natural phenomena<br>▪ Modelling of ionosphere dynamics and the Total Electron Content<br>▪ Mitigation of the effects of satellite navigation signals' intentional interference<br>▪ Alternative PNT methods and technologies |
| Jasmin Ćelić, PhD | ▪ Effects of traffic-related pollution on the environment |
| Aleksandar Cuculić, PhD | ▪ Power flow optimization in hybrid vessel charging systems<br>▪ Techno economic analysis of renewable sources implementation in nautical marinas<br>▪ A contribution to increasing the safety of navigation of merchant ships by the use of hybrid propulsion |
| Borna Debelić, PhD | ▪ Possibilities for Improvements and Integration of the Governance System of the Maritime Common Good as a Complex Resource<br>▪ Open Access to Maritime Common Good as a Competitive Advantage in the Development of the Coastal Economy<br>▪ Decision-making Mechanisms as the Basis of Integrated Coastal Zone Management |
| Vlado Frančić, PhD | ▪ Systematic maritime traffic management and monitoring<br>▪ Modelling of maritime traffic flow<br>▪ Models of improving safety of navigation by applying new technologies<br>▪ Models of maritime education and training |
| Neven Grubišić, PhD | ▪ Activity based modelling in transport<br>▪ Multimodal traffic simulations<br>▪ Vehicle air pollution microsimulation models<br>▪ CAV - Connected and Automated/Autonomous vehicles<br>▪ Fleet management and public transport optimization<br>▪ Port and shipping operation simulation |
| Renato Ivče, PhD | ▪ Protection of Croatian ports of entry of foreign invasive organisms through ballast water<br>▪ Protection of the underwater part of the vessel's and other crafts' hull with antifouling paints<br>▪ Maintenance of the hull of a container vessel in modern conditions of its economic exploitation<br>▪ Optimal capacities of feeder container vessels<br>▪ Container ship management and administration from a safety aspect |
| Alen Jugović, PhD | ▪ Identification of elements, defining the concept of development and management of seaports<br>▪ Structural approach to the development of the green port concept from the aspect of sustainability<br>▪ Rationalization of maritime passenger traffic<br>▪ Consumer behaviour in the marina location choice problem |
| Irena Jurdana, PhD | ▪ Communication networks in the ship's systems by using optical technology:<br>▪ Optical sensor systems for measuring electrical and non-electrical values<br>▪ Submarine optical networks: construction, safety and protection, the impact on the marine environment, technical and legal aspects<br>▪ Application of image processing and deep learning algorithms for maritime object recognition<br>▪ Application of underwater signal and image processing methods<br>▪ Application of time-frequency transformations and statistical analysis of signals from maritime systems<br>▪ Application of intersection of confidence intervals methods for denoising signals from maritime systems |
| Serđo Kos, PhD | ▪ Ionosphere dynamics and geomagnetic elements |

| Name | Research topics |
|---|---|
| | ▪ Influence of LAIC (Lithosphere-Atmosphere-Ionosphere Coupling) on GNSS<br>▪ Ionospheric / Tropospheric effects on the operation of satellite navigation systems and their reduction / removal<br>▪ The EM satellite signal multipath and methods of mitigation<br>▪ Intentional interferences of GNSS signals - detection techniques and mitigation procedures<br>▪ Satellite navigation signal - noise loss |
| Lovro Maglić, PhD | ▪ Technological and organizational solutions and innovative technologies in navigation management.<br>▪ Innovative and ecologically acceptable mooring and anchoring systems<br>▪ 3D model development of underwater structures<br>▪ Workload research in maritime sector |
| Livia Maglić, PhD | ▪ Adaptive port planning<br>▪ Storage and stacking logistics problems at container terminals<br>▪ Sustainable marinas<br>▪ Assessment of crane operator's workload |
| Đani Mohović, PhD | ▪ Model for determining the minimum avoidance distance between vessels in collision courses |
| Robert Mohović, PhD | ▪ Research of the maritime aspect of the planning and design of ports and waterways in confined areas |
| Ana Perić Hadžić, PhD | ▪ Optimization of the logistics service of using autonomous vehicles by the supply chain accessibility model<br>▪ Public-private partnership models in the port area<br>▪ Public-private partnership models for the smart city concept and development |
| Radoslav Radonja, PhD | ▪ Exhaust emissions from marine energy systems and their environmental impact<br>▪ Possibilities of using alternative fuels in maritime transportation<br>▪ Acidification and eutrophication of the sea |
| Boris Sviličić, PhD | ▪ Maritime cyber risk security |
| Edvard Tijan, PhD | ▪ Transport digitalization/Seaport digitalization<br>▪ Digital transformation of transport/Digital transformation of seaports<br>▪ Information systems in transport/Information systems in seaports<br>▪ Information management in transport/Information management in seaports<br>▪ Maritime Single Windows<br>▪ Port Community Systems |
| Sanjin Valčić, PhD | ▪ Modernization of the Global Maritime Distress and Safety System<br>▪ Atmospheric impact analysis on digital maritime communication systems<br>▪ Application of 5G networks in maritime communications<br>▪ Potential applications of VHF Data Exchange System in maritime domain |
| Goran Vukelić, PhD | ▪ Marine environment effect on mechanical properties of modern (additively manufactured and smart) materials<br>▪ Weldability of additively manufactured metals<br>▪ Optimization of composite patch repair of metal structures<br>▪ Development of additive technology in maritime industry |
| Dražen Žgaljić, PhD | ▪ Developing a model for assessing the success potential of maritime transport route or service<br>▪ Defining the elements and development concept of sustainable small ports |
| Srđan Žuškin, PhD | ▪ Concepts and development possibilities of navigation information systems in the function of increasing safety at sea<br>▪ Concepts and development possibilities of navigation information systems in the function of environmental protection<br>▪ Concepts and development possibilities of navigation information systems in the function of increasing Maritime cybersecurity |
| Saša Aksentijević, PhD | ▪ Information security and business continuity in logistics companies<br>▪ Development of single interfaces (single-window) in the maritime sector<br>▪ Application of disruptive technologies in logistics |

| Name | Research topics |
|---|---|
| Mate Barić, PhD | ▪ Ship trajectory prediction in width and depth limited fairways<br>▪ Influence of specific elements in ship to ship interaction during overtaking and head on encounter |
| Luka Mihanović, PhD | ▪ Implementation of Artificial Intelligence in Mine warfare<br>▪ Optimization of the utilization of Autonomous Underwater Vehicles to protect underwater.<br>▪ Enhancement of the Underwater Situational Awareness in the Sea Lines of Communication, ports, and port approaches of the enclosed sea.<br>▪ Crisis management model in the Adriatic Sea<br>▪ Underwater Mine Countermeasures in underwater safety<br>▪ Evaluation of the Mine warfare in the Sea (in Sea Denial)<br>▪ The development / improvement of EOD (Explosive Ordnance Disposal) Capabilities as part of underwater security of the enclosed sea |
| Josip Orović, PhD | ▪ Optimization of ship propulsion systems<br>▪ Analysis of faults and failures in ship propulsion systems |
| Luka Vukić, PhD | ▪ Sustainability of the maritime transport system |