



Międzynarodowa Środowiskowa Szkoła Doktorska
przy **Centrum Studiów Polarnych**
w Uniwersytecie Śląskim w Katowicach

ul. Bedzińska 60
41-200 Sosnowiec
tel. +48 32 368 93 80
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www.mssd.us.edu.pl



Reference No: IEDS/2020/US/06

Proposal of PhD dissertation:

Advanced polymer and carbon materials in water and medical rescue

Leading unit: International Environmental Doctoral School associated with the Centre for Polar Studies at the University of Silesia in Katowice (IEDS) – Institute of Earth Sciences, the University of Silesia

Mode of study: full-time

Degree to be obtained: PhD in the field of natural sciences, in the discipline: Material engineering

Duration: 4 years (8 semesters), from October 2020

Language: English

Scholarship: approx. 2370 PLN monthly (1-2nd year); approx. 3650 PLN monthly (3-4th year)

Requirements and regulations: www.mssd.us.edu.pl/kandydat-mssd/

Registration online: www.irk.us.edu.pl

Conditions of recruitment:

I STAGE: Knowledge test in the field of discipline. The test is scored on points: from 0 to 10 points.

A positive result of the test is that the candidate gets a minimum of 7 points. Absence on the test disqualifies the candidate from the entire qualification procedure.

II STAGE: a) the final result of the candidate's completion of higher education (maximum 6 points, diploma grading ratio: 6.0 (excellent) - 6 points, 5.0 - 5 points, 4.5 - 4 points, 4.0 - 3 points, 3.5 - 2 points, 3.0 - 1 point), b) for candidates (students) referred to in art. 186 para. 2 of the Act - a certificate of average grade from at least three years of uniform Master's studies, rounded to one decimal place, according to the conversion factor: 6.0 (excellent) - 6 points; 5.0 - 5 points; 4.5 - 4 points; 4.0 - 3 points; 3.5 - 2 points; 3.0 - 1 point).



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III STAGE: Interview for assessing: the candidate's intellectual level, knowledge of English, substantive level of the doctoral dissertation project, motivations and predispositions for scientific work, previous scientific achievements of the candidate (maximum 15 points).

Requirements:

- 1) Completed second-cycle studies (master's degree) in Biomedical Engineering / Materials Engineering or related fields. Knowledge of research topics related to design in the CAD CAM environment and knowledge of basic methods of processing polymer materials and composites
- 2) Knowledge of design issues, typical tools and methods used in material and biomedical engineering.
- 3) Knowledge of English enabling communication, reading and writing scientific papers.

Task description:

- 1) Analysis of literature data in terms of identifying the research problem;
- 2) Acquisition, processing and analysis of collected data (setting theses and research purpose of the work)
- 3) Preparation, organization and conducting research;
- 4) Preparation of scientific articles, patent claims and conference presentations;
- 5) Regular reporting of work progress;
- 6) Assistance in everyday scientific and didactic tasks of the unit, including co-care over measuring apparatus.

Abstract

In the present era of the global village and the widespread viral infection, there is a problem of rapid response of medical and emergency services to the needs of the injured party. To facilitate these activities it is important to use ever better, lighter, more friendly and ergonomic rescue equipment that would be available on the first line of the fight for human safety and life. Such equipment, especially in medical rescue and water rescue, should be characterized by reliability, low unladen weight, very good ergonomics and as demonstrated by recent months be resistant to biofilm production or transmission of viral infections.



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This work will be focused on the production and design of materials and equipment used in medical and water rescue such as water rescue boards, rescue boards, small equipment, personal protective equipment and barrier equipment for applications in the event of the need to save human life or health with a special focus on sudden stop circulation. The emphasis will be on creating an ultra-light and fast surfboard that will allow the rescuer to reach the victim immediately, then carry out basic life-saving procedures without exposure or with minimized exposure of the rescuer to microbial threats, and a similar board used in emergency medical services. The work will end with the creation of a model and prototype of both boards and their use by professional rescue teams in practice.

Developed systems will significantly reduce the impact of a pandemic on the natural environment and the safety of both people and rescuers.

Additional information:

- 1) The work will be implemented under the substantive supervision of dr hab. Andrzej Swinarew prof. UŚ, andrzej.swinarew@us.edu.pl, Institute of Materials Engineering, University of Silesia in Katowice,
- 2) Contact: Sekretarz Komisji Rekrutacyjnej MŚSD: +48 32 3689 380, polarknow@us.edu.pl, www.mssd.us.edu.pl