



ALAR
Training Center



ONLINE SUMMER SCHOOL

BIOENGINEERING

July 5 - 16, 2021

**LEARN MORE ABOUT ADVANCED TECHNOLOGIES,
JOIN THIS SUMMER SCHOOL!**

ECTS credits: 4.0



POLYTECH

Peter the Great
St. Petersburg Polytechnic
University



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BRIEF DESCRIPTION

The course is suitable as the first bioengineering course or an add-on course for senior undergraduate students and graduate students.

The primary objective of the course is to present the fundamentals of biomaterials physics and technology particularly highlighting specific fields of cryoconservation and tissue engineering. The lectures cover polymeric implants, scaffold engineering, topics of cryobiology, cryotechnology, artificial organs. The program also includes online visit to an electrispinning laboratory and working on a project in small teams.

Cost:

US\$421 - includes registration, teaching costs, 4.0 ECTS credits Certificate, additional Russian Language virtual course by ALAR Training Center (33h) + Certificate

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Program dates: July 5 - 16, 2021

Registration deadline: 14 June 2021

Entrance requirements

- - Knowledge of Chemistry and Physics corresponding to the first two years of a Bachelor's degree program in physics, mathematics, technology etc;
- - Good command of English. All classes and extracurricular activities are conducted in English. Knowledge of the Russian language is not required;
- - Applicants are expected to have at least 2 year of University level studies.

Professors and lecturers

- - Prof. Birgit GLASMACHER, professor, director of the institute for multiphase processes, Leibniz University of Hannover (Germany)
- - Dr. Oleksandr GRYSHKOV, Associate Professor, institute for multiphase processes, Leibniz University of Hannover (Germany)
- - Dr. Viktoria KAPRALOVA, Associate Professor, Peter the Great St. Petersburg Polytechnic University (Russia)

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Course description

This course will cover fundamentals combined with up-to-date research topics in specific fields of Biomedical Engineering. Students will expand their knowledge on mass and heat transport in the human body. The lectures will also include basics of polymer science and electrospinning. The students will apply these fundamentals to the field of tissue engineering, polymeric scaffold engineering and deep temperature engineering (cryotechnology). They will learn about polymeric implants, how to design artificial lungs and kidneys as well as how to overcome the shortage of donor organs by engineering exemplarily living heart valves and vascular grafts in a bioreactor. In order to allow for long-term on-the-shelf availability, these engineered tissues have to be stored at deep temperatures in special freezers. Therefore, the students will be introduced to the topics of cryobiology and cryotechnology to be able to solve those storage requirements.

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